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PRAFACE

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The ISS2022 Symposium, organized on the online platform as NWSA Academic Journals, was successfully concluded with the theme of "New Horizons in Science" with professional institutions and organizations as well as seven different countries and different higher education institutions.

The NWSA Family believes that science can only improve when shared. In line with this belief, it brings together different branches of science to create joint projects and common research areas among the branches of science, to meet, to support ideas and consensus, and to offer academic environments to develop collaborations.

In this context, "ISS2022 Abstract Book" and "ISS2022 Proceeding Book" have been prepared for the ISS2022 symposium. ISS2022 Abstract Book contains summaries of all articles. The full texts of the eight articles that were orally presented were published in this book and the other papers were published in NWSA Academic Journals (according to the author's request).

I would like to thank the Rector of the International University of Sarajevo Prof.Dr. Ahmet YILDIRIM, Assoc.Prof.Dr. Aliye Fatma MATARACI, and the members of the Organizing and Scientific Committee. I wish that the ISS2022 Proceedings Book will be beneficial to universal science.

Hope to see you again at the Sixth Science Festival and share what we know with the interested parties...

NWSA Akademik Dergiler olarak çevrimiçi platformda düzenlenen ISS2022 Sempozyumu "Bilimde Yeni Ufuklar" teması ile yedi farklı ülkeden ve farklı yükseköğretim kurumlarının yanı sıra mesleki kurum ve kuruluşlar ile başarılı bir şekilde tamamlanmıştır.

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Bu bağlamda ISS2022 sempozyumu için "ISS2022 Abstract Book" ve "ISS2022 Proceeding Book" hazırlanmıştır. ***ISS2022 Abstract Book*** *kitabında bütün makalelerin özetleri yer almaktadır. Sözlü sunumu yapılan sekiz makalenin tam metinleri bu kitapta, diğer tebliğler ise NWSA Akademik Dergilerde (yazar isteğine göre) yayımlanmıştır.*

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VI. Bilim Şenliğinde tekrar görüşmek ve bildiklerimizi ilgili taraflarla paylaşmak dileğiyle …

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POLİMER KAPLI HAFİF PANELLERİN ÇATI MAKASI ÜZERİNE ETKİSİNİN SONLU ELEMANLAR YÖNTEMİ KULLANILARAK MODELLENMESİ

ÖZ

Isı ve su yalıtımı sağlayacak polimer kaplı hafif eleman olarak üretilen panellerin çatı kaplama malzemesi olarak kullanılabilirliği bu çalışmada incelenmiştir. Bu amaçla, 20x20x5cm ölçütlerinde polimer kaplı hafif agregalı paneller hacimce %20, %35 ve %50 oranlarında polimer kullanılarak üretilerek fiziksel ve mekanik özellikleri tespit edilmiştir. Örnek çalışma olarak genişliği 12 m, uzunluğu 12 m ve yüksekliği 3 m olan bir soğuk hava deposu sonlu eleman modelinde ele alınmıştır. Çatı makası olarak sahada yaygın bir biçimde kullanılan trapez çatı makası seçilerek statik hesapları sap2000 programı kullanılarak analiz edilmiştir. Aynı model sandviç panel kullanılarak analiz edilerek çatı makası elemanlarının gerilmeleri ve deplasmanları karşılaştırmalı olarak incelenmiştir.

Anahtar Kelimeler: Hafif Paneller, Yalıtım, Trapez Çatı Makası, Sap2000, Hafif Agrega

FINITE ELEMENT MODELING OF THE EFFECT OF POLYMER COATED LIGHTWEIGHT PANELS ON ROOF FRAMING

ABSTRACT

The usability of the polymer-coated lightweight panels that will provide heat and water insulation as a roofing material has been investigated in this study. For this purpose, 20x20x5cm sized polymer-coated lightweight panels were produced using 20%, 35%, and 50% polymer by volume, and their physical and mechanical properties were determined. As a case study, a cold air cabinet with a 12x12x3m dimension is modeled in a finite element model. The trapezoidal roof truss, widely used on the site, was preferred as the roof truss and its static analyses were analyzed using the sap2000 program. The stresses and displacements of the roof truss elements were analyzed comparatively using the same model with the sandwich panel.

Keywords: Lightweight Panels, Insulation, Trapezoidal Roof Truss, Sap2000, Lightweight Aggregate

1. GİRİŞ (INTRODUCTION)

Binayı üstten gelen kar, yağmur, rüzgar, sıcak soğuk gibi dış tesirlere karşı korumak, estetik bir güzellik ve bütünlük kazandırmak amacı ile inşa edilen yapı elemanlarına çatı denilmektedir. Çatılar sadece ahşap, çelik, betonarme malzemelerden veya bu malzemelerin birlikte kullanılması ile inşa edilebilirler. Çatının şekline yörenin iklim koşulları etkimektedir. Binanın şekli, cinsi oturacağı mesnet durumu çatının şekil ve cinsinin tespit edilmesinde dikkat edilecek hususlardır. Çatıyı dış tesirlere karşı korumak için örtü kısmı ile kar ve rüzgar yükünü taşıyan taşıyıcı kısımdır. Çatı üzerine düşen kar ve yağmur sularını en kolay ve en iyi bir şekilde uzaklaştırmalıdır. Çatının üzerine gelen yağmur ve kar sularını nakletmeye yarayan dere oluk ve düşey borular çatının tamamlayıcı kısımlarıdır [1]. Çatı her ne kadar genelde binanın üstünü örten bir yapı elemanı ise de yapı/bina kavramının tümleyicisi ayrıca mimari bütünlüğün sağlanmasında ana elemanlardan biridir [2]. Çatı kaplamaları bölgelerin iklim koşulları ve yapının kullanım amacına göre çeşitli malzemelerden oluşmaktadır. Soğuk hava depolarında genellikle poliüretan dolgulu alüminyum sandviç paneller çatı kaplama malzemesi olarak kullanılmaktadır. Poliüretan dolgulu alüminyum sandviç panellerin yangına karşı elverişsizliği ve ısı yalıtımdaki olumsuzluklar soğuk hava depolarında farklı bir malzeme kullanılması gerektiği sorusunu doğurmuştur. Doğal hafif agrega, meydana gelişleri sırasında gözenekli bir yapı kazanmış bulunan tüf, bims, sünger taşı, lav cürufu, diatomit vb. kırılmış veya kırılmamış agregalar olarak nitelendirilmiştir [2]. Bu çalışmada hafif agregalar hacimce %20, %35 ve %50 oranlarında polimer kullanılarak 20*20*5cm boyutlarında paneller üretilmiştir. Burada hafif agregaların kullanım nedeni hep birim ağırlığının az olması hem de ısıl iletkenlik katsayısının yüksek olmasından kaynaklanmaktadır.

2. ÇALIŞMANIN ÖNEMİ (RESEARCH SIGNIFICANCE)

Çatı kaplama malzemelerinin ağırlığı artıkça makas elemanlarında oluşan iç kuvvetler artmaktadır. Ancak hafif çatı malzemelerinde kalınlığın azalması nedeniyle ısı yalıtımı azalmaktadır. Bu nedenden dolayı soğuk hava depolarında ısı yalıtımını artırmak için kalın sandviç paneller kullanılmaktadır. Bu çalışmada soğuk hava depolarının çatılarında kullanılan sandviç panel yerine hafif agregalar ve polimer malzemelerin karışımı ile üretilen panellerin kullanımı araştırılmıştır. Bu çalışma çatı malzemelerinin ağırlığını azaltmak ve ısıl yalıtımı yüksek malzeme kullanılması amacıyla yapılmıştır.

3. DENEYSEL ÇALIŞMA VE ANALİTİK ÇALIŞMA (EXPERIMENTAL METHOD-PROCESS AND ANALYTICAL STUDY)

Çatı kaplama malzemelerinin ağırlığı artıkça makas elemanlarında oluşan iç kuvvetler artmaktadır. Ancak hafif çatı malzemelerinde kalınlığın azalması nedeniyle ısı yalıtımı azalmaktadır. Bu nedenden dolayı soğuk hava depolarında ısı yalıtımını artırmak için kalın sandviç paneller kullanılmaktadır.

Tablo 1. Hafif Agregalı polimer malzemelerin özellikleri
(Table 1. Properties of Light Aggregate polymer materials)

Malzeme Adı	Birim Ağırlığı (gr/cm^3)	Isıl İletim Katsayısı (W/m.K)	Basınç Dayanımı (Mpa)
P20	0.73	0.571	98.24
P35	0.94	0.570	140.06
P50	0.96	0.568	71.90

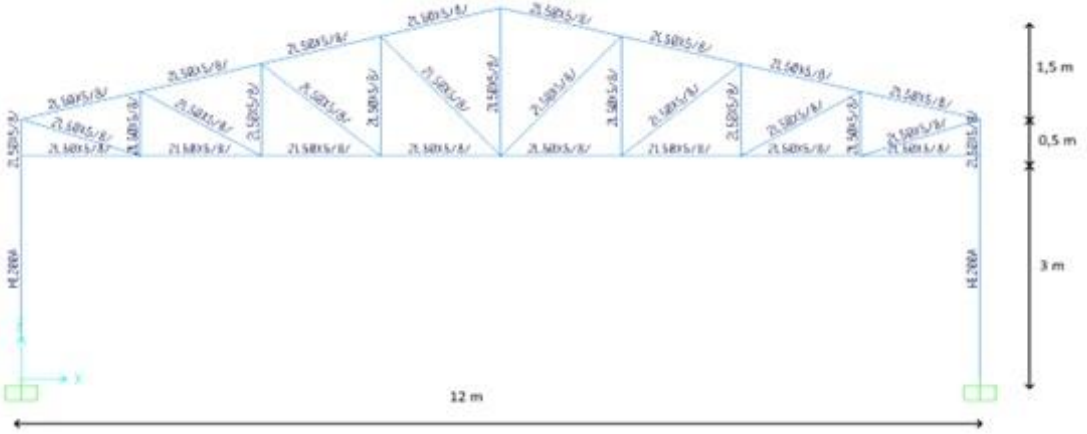
Bu çalışmada hafif hafif agregalar kullanılarak hacimce %20, %35 ve %50 oranlarında polimer malzeme kullanılarak bu malzemelerin ısıl iletkenlik katsayıları ve birim ağırlıkları elde edilmiştir (Tablo 1).

Yapılan çalışmada hafif agregalar polimer malzemelerle hacimce %20, %35 ve %50 karıştırılarak 5 gün kalıpta bekletilerek priz alması sağlanmıştır. Bu beş günün sonunda kalıplardan çıkarılarak mekanik özellikleri elde edilmiştir (Şekil 1).

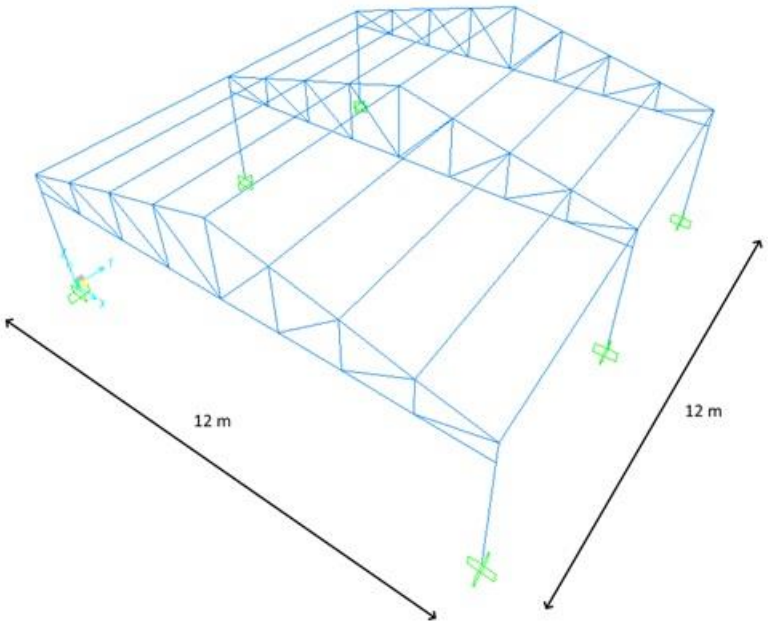
Resim 1. Hafif agregalı polimer malzemelerin üretilmesi
(Figure 1. Production of lightweight aggregate polymer materials)

Üretim esnasında hacimce %20 polimer malzeme ile karıştırılan panelin hacminde herhangi bir değişiklik meydana gelmemiştir. Ancak hacimce %35 ve %50 oranında polimer malzeme kullanılarak üretilen panellerde hacminde artış olduğu anlaşılmıştır. Bu çalışmada 12*12*3 metre ebatlarında örnek bir soğuk hava deposu incelenmiştir. Çatı taşıyıcı sistemi trapez makas seçilmiştir. Çatı eğimi % 25 olarak seçilmiştir. Makas sisteminde kesitler alt başlık, üst başlık, dikme ve diyagonellerde 2L 50.5/8 profilleri seçilmiştir. Kolonlarda kesitler HEA 200 profili seçilmiştir. Çatı aşıklarında kesiler UPE 120 profili seçilmiştir (Şekil 2, Şekil 3).

12*12*3 metre boyutundaki soğuk hava deposu Sap2000 programında modelli dizayn edilmiştir. Yükleme olarak çatı kaplama yükü sisteme etki ettirilmiştir. Sisteme 4 farklı yük ayrı ayrı etki ettirilip statik analizi yapılmıştır. Sistemde ilk olarak çatı kaplama malzemesi olarak 5 cm kalınlığında sandviç panel seçilip metre kareye 15kgf/m^2 lik yük etki ettirilmiştir. İkinci olarak çatı kaplama malzemesi 5 cm kalınlığında hacimce %20 polimer malzeme ile hafif agregaların karışımından elde edilen panel seçilip metre kareye 36.50kgf/m^2 lik yük etki ettirilmiştir. Üçüncü olarak çatı kaplama malzemesi 5cm kalınlığında hacimce %35 polimer malzeme ile hafif agregaların karışımından elde edilen panel seçilip metre kareye 48kgf/m^2 lik yük etki ettirilmiştir. Son olarak çatı kaplama malzemesi 5cm kalınlığında hacimce %50 polimer malzeme ile hafif agregaların karışımından elde edilen panel seçilip metre kareye 47kgf/m^2 lik yük etki ettirilmiştir. Belirtilen dört yükleme sisteme ayrı ayrı etki ettirilip Sap2000 programıyla statik analizi yapılmıştır.



Şekil 2. Trapez Makas Sisteminin kesit görünüşü
(Figure 2. Sectional view of the Trapezoidal Truss System)



Şekil 3. Trapez Makas Sisteminin 3D görünüşü
(Figure 3. 3D view of the Trapezoidal Truss System)

4. BULGULAR (FINDINGS)

Bu çalışmada dört farklı çatı kaplama malzemesine göre statik analizler Sap2000 programı yardımıyla yapılmıştır. Elde edilen statik analiz sonuçlarına göre dört farklı sistemin maksimum çubuk kuvvetleri ve makasın alt orta açıklığındaki deplasman değerleri bulunmuştur (Tablo 2).

Tablo 2. Maksimum çubuk kuvvetleri ve deformasyonlar
(Table 2. Maximum bar forces and deformations)

Malzeme Cinsi	Maksimum Çekme Kuvveti(kN)	Maksimum Defermasyon(mm)
Sandviç Panel	23.87	-3.187
P20	35.37	-4.720
P35	42.27	-5.645
P50	-42.15	-5.798

Yapılan deneyler ve statik analizler sonucunda aşağıda verilen sonuçlara varılmıştır.

- Kullanılan hafif agregalar ve polimer malzeme ile yapılan paneller çubuk kuvvetlerini artırdığı anlaşılmıştır.
- Kullanılan hafif agregalar ve polimer malzeme ile yapılan paneller makas düğüm noktalarında düşey yönde deplasmanı artırdığı anlaşılmıştır.
- Yangına karşı dayanıklı yapısından dolayı kullanılabilir olduğu anlaşılmıştır.
- Yapılan deneyler sonucu malzemenin sandviç panele göre daha elastik olduğu anlaşılmıştır. Bu durumda çarpma kuvvetine karşı daha güvenli olduğu anlaşılmıştır.

NOTE

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SOĞUK HAVA KABİNLERİ İÇİN TASARLANMIŞ POLİMER KAPLI POMZA AGREGALI PANELLERİN PERFORMANS DEĞERLENDİRMESİ

ÖZ

Yeryüzündeki volkanik faaliyetler sonucu oluşan pomza, gözenekli yapısı ve düşük birim hacim ağırlığı nedeniyle ısı yalıtımı ve yangına karşı direnç istenen birçok uygulamada tercih edilmektedir. Bu çalışmada, polimer kaplı pomza agregaları ile 20x20x5cm ebadında paneller üretilmiştir. Hacimce %20, %35 ve %50 oranlarında polimer kullanılarak üretilen paneller, soğuk hava kabinlerinde ısı yalıtımı sağlamak amacıyla yaygın olarak kullanılan panellerle fiziksel, mekanik ve termal özellikler açsısından karşılaştırılmıştır. Sonuç olarak polimerle kaplı pomza agregası ile üretilen panellerin soğuk hava depolarında kullanım potansiyelinin olduğu görülmüştür.

Anahtar Kelimeler: Pomza, Yalıtım, Soğuk Hava Kabini, Polimer, Panel

PERFORMANCE EVALUATION OF POLYMER COATED PUMICE AGGREGATE PANELS DESIGNED FOR COLD AIR CABINETS

ABSTRACT

Pumice, which is formed due to volcanic activities on the earth, is preferred in many applications where thermal insulation and fire resistance are required because of its porous structure and low density. In this study, 20x20x5cm panels were produced with polymer-coated pumice aggregates. Panels produced using 20%, 35%, and 50% polymers by vol. were compared with other panels, which are commonly used to provide thermal insulation in cold air cabinets, in terms of physical, mechanical, and thermal properties. As a result, it is concluded that the panels produced with polymer-coated pumice aggregate have the potential to be used in cold air cabinets.

Keywords: Pumice, Insulation, Cold Air Cabinet, Polymer, Panel

1. GİRİŞ (INTRODUCTION)

Isı yalıtımı ısıtma veya soğutma oluşan enerjinin belirli bir ortamda kalmasını amacıyla yapılmaktadır. Yapılarda bu enerjiyi sağlayabilmek için kalın ve ağır malzemelerden hafif ve ince malzemeler kullanılmaya geçilmiştir [1]. Sonuç olarak yaşadığımız binalarda daha az seviyede enerji kullanarak ısıl konfor şartlarımızı sağlamamızın en önemli unsur ısı yalıtımı uygulamasıdır [2]. Bu sebeple de yapıların yalıtımında, inşaat, makine, ekonomi, kimya ve mimarlık gibi birçok bilim dalı birlikte çalışılarak geliştirilmelidir [3]. Günümüzde soğuk depoculukta yalıtım ve yapı malzemesi olarak birçok farklı ürün kullanılmaktadır. Yalıtım malzemelerinde oldukça geniş bir ürün çeşitliliği olması ile günümüzde bu alanda birçok çalışma yapılmaktadır. Polysitren, fiberglas, polietilen gibi birçok yalıtım malzemesi düşük ısı iletkenliği nedeniyle ısı kaybını azaltmak amacıyla birçok uygulamalarda kullanılmaktadır [4]. Yalıtım malzemelerinin özellikleri, malzemenin yalıtım kalınlığı, kullanılan malzeme çeşidi ve malzemenin uygulanışı gibi bileşenlerden oluşur. Bu sebeple, katmanlar halinde ısı yalıtım malzemesinin uygulanması ile ısı kaybının azaltılacağı ve yalıtım malzemesinin ısı iletkenliğini arttırılabileceği öngörülmektedir [5].

2. ÇALIŞMANIN ÖNEMİ (RESEARCH SIGNIFICANCE)

Bu çalışmamızda soğuk depolarda yapı ve yalıtım malzemesi olarak kullanılmak üzere polimer kaplı ponza takviyeli panel geliştirilerek üretilmiş ve farklı karışım oranları ile üretilen numunelerin ısı iletim katsayıları deneysel olarak hesaplanmıştır. Yapılan gözlemler ve deneyler sonucunda görüşmüştür ki; polimer kaplı ponza takviyeli paneller iyi bir ısı yalıtımı yapmakta ve yapı malzemesi olarak kullanılabilmektedir.

3. DENEYSEL YÖNTEM (EXPERIMENTAL METHOD)

Çalışmada hafif agrega olarak Ahlat bölgesinden temin edilen bazaltik pomza kullanılmıştır (Tablo 1). Polimer olarak poliüretan esaslı tek bileşenli Köster KB-Pur 214 ürünü kullanılmıştır (Tablo 2).

Tablo 1. Pomza agregası fiziksel ve mekanik özellikleri
(Table 1. Pumice aggregate and its mechanical properties)

	Birim Hacim Ağırlığı (gr/cm^3)	24 Saat Su Emme Oranı (%)	Agrega Darbe Dayanımı Değeri (%)
Ahlat Pomzası	0.69	30	76.09

Tablo 2. Fiziksel ve kimyasal özellikleri
(Table 2. Physical and chemical properties)

Çekme Mukavemeti (7 Gün)	$>4.0N/mm^2$
Kopma Uzaması (7 Gün)	>%250
Yoğunluğu	$1.45g/cm^2$
Sertleşme süresi	4-7gün
Shore A sertliği	70-75
Servis Sıcaklığı	-30°C ile +80°C

Sınıflandırılarak elenen pomza agregaları maksimum agrega çapı 16mm seçilmiştir. Uygun agrega dağılımına getirilen agregalar farklı oranlarda polimerlerle karıştırılarak paneller elde edilmiştir (Tablo 3).

Tablo 3. Panel üretiminde kullanılan malzemelerin karışım oranları yüzde miktarları
(Table 3. Mixing ratios and percentage amounts of materials used in panel production)

Numune Kodu	Pomza Agregası Miktarı (%)	Polimer Miktarı (%)
P20	75	25
P35	60	30
P50	50	50

%25, %30, %50 oranlarındaki polimerler ayrı ayrı hazırlanarak 20x20x5cm dikdörtgen prizma ve 10*20cm ölçülerinde silidir kalıplara dökülmüştür.5 gün sonunda kalıplardan çıkarılarak incelenmiştir (Resim 1, Resim 2 ve Resim 3).

Resim 1. Agrega ve polimerlerin karıştırılması
(Picture 1. Mixing of aggregates and polymers)

Resim 2. Numunelerin kalıplara yerleştirilmesi
(Picture 2. Placing the samples in the molds)

Resim 3. Kalıptan çıkarılan numuneler
(Picture 3. Samples removed from the mold)

Hacimce %25, %30 ve %50 oranlarında polimer ile kaplanarak hazırlanan numunelerin basınç dayanımları(Resim 4) ve birim hacim ağrılıları tespit edilmiştir.

Resim 4. Numunelerin basınç dayanımı deneyi
(Picture 4. Compressive strength test of samples)

Panellerin ısı iletim katsayılarını hesaplamak için panellerin bir yüzeyine aynı büyüklükte ısı verilmiş ve iletimle olan ısı transferleri ayrı ayrı hesaplanmıştır.

4. BULGULAR (FINDINGS)

Üretilen numunelerin basınç dayanımı ve birim hacim ağırlıkları Tablo 4'de verilmiştir.

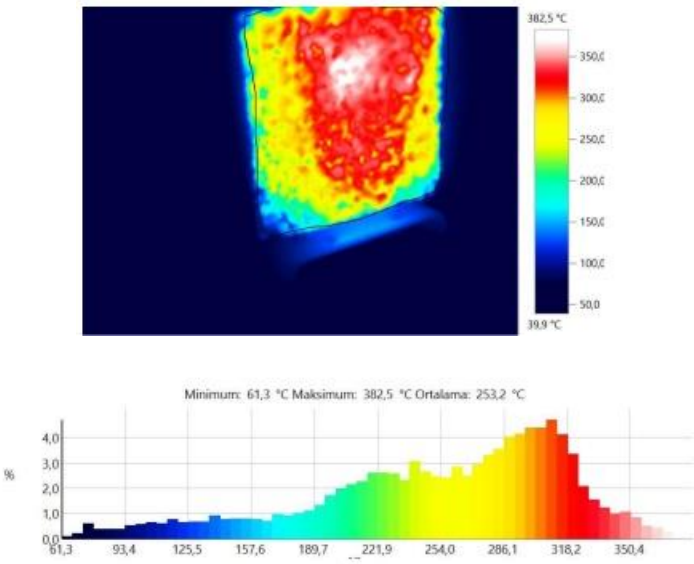
Tablo 4. Üretilen numunelerin fiziksel ve mekanik özellikleri
(Table 4. Physical and mechanical properties of the produced samples)

Numune Kodu	Basınç Dayanımı (Mpa)	Birim Hacim Ağırlığı (g/cm^3)
P20	98.24	0.73
P35	140.06	0.94
P50	71.90	0.96

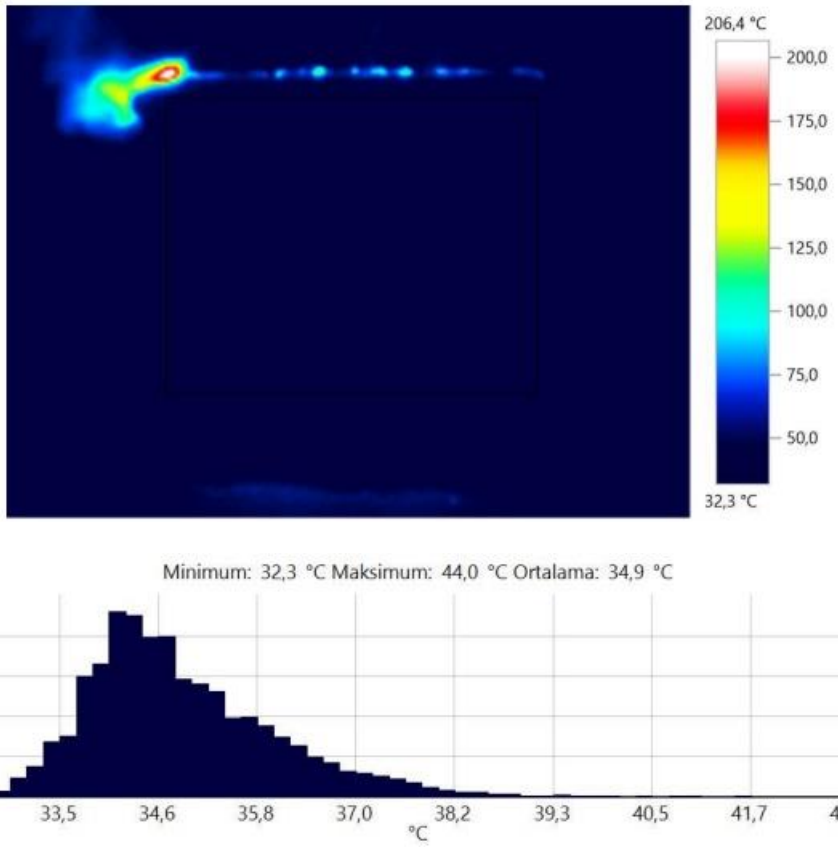
Tablo 5. Üretilen Malzemelerin Isıl iletim katsayıları(W/mK)
(Table 5. Heat transfer coefficients of the produced materials (W/mK)

Numune Kodu	Isıl İletim Katsayısı λ (W/mK)
P20	0.571
P35	0.570
P50	0.568

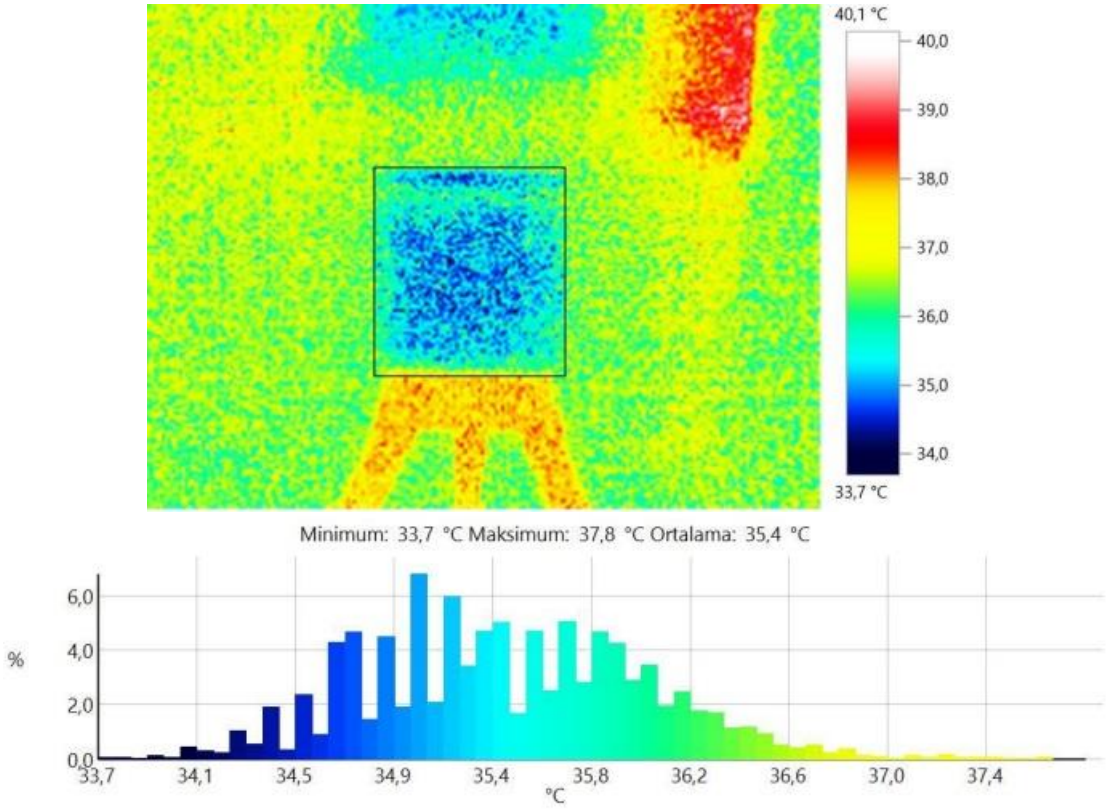
Üretilen panellerin bir yüzeyine aynı büyüklükte ısı verilmiş ve iletimle olan ısı transferleri ayrı ayrı hesaplanmıştır. Buna göre ısı verilen yüzeylerin ortalama sıcaklıkları 253,2^{o}C ölçülmüş olup ısı transfer edilen yüzeyler arası mutlak sıcaklık farkı alınarak ölçümler yapılmıştır. Şekil 1'de 3 numunenin yüzeyine uygulanan özdeş ısı dağılımının termal görüntüsü görülmektedir. Buna göre yüzeye uygulanan ısı neticesinde oluşan ortalama sıcaklık 253.2°C'dir. Şekil 2, 3, 4'de numunelerin diğer yüzeylerine olan ısı geçişlerinin termal görüntüleri görülmektedir. Tüm bu bilgiler ışığında hesaplamalar yüzeylerin ortalama sıcaklıklarına göre yapılmış olup Tablo 5'de görülen sonuçlar elde edilmiştir.



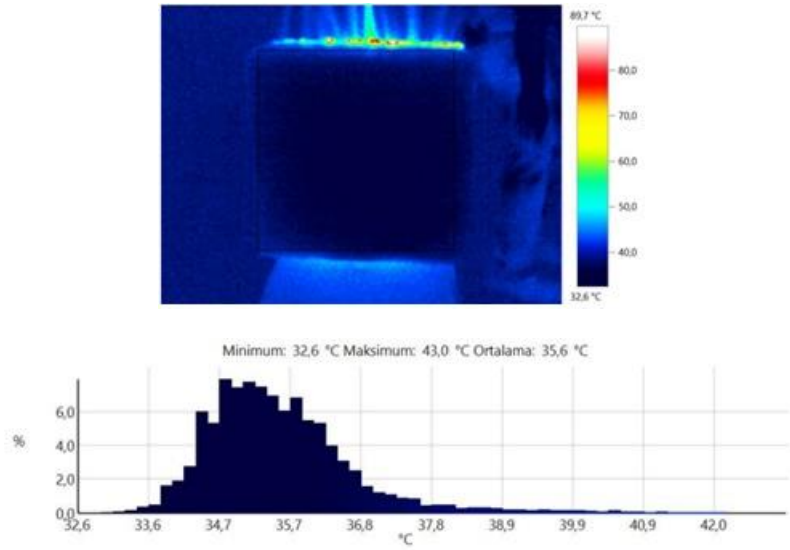
Şekil 1. P50, P30, P25 numunelerinin bir yüzeyine uygulanan ısı neticesinde yüzeylerde oluşan sıcaklık dağılımının termal görüntüsü
(Figure 1. The thermal image of the temperature distribution on the surfaces as a result of the heat applied to one surface of the P50, P30, P25 samples)



Şekil 2. P50 numunesinin diğer yüzeyine olan ısı geçişi ve yüzeyde oluşan sıcaklık dağılımının termal görüntüsü
(Figure 2. The thermal image of the heat transfer to the other surface of the P50 sample and the temperature distribution on the surface)



Şekil 3. P30 numunesinin diğer yüzeyine olan ısı geçişi ve yüzeyde oluşan sıcaklık dağılımının termal görüntüsü
(Figure 3. The thermal image of the heat transfer to the other surface of the P30 sample and the temperature distribution on the surface)



Şekil 4. P25 numunesinin diğer yüzeyine olan ısı geçişi ve yüzeyde oluşan sıcaklık dağılımının termal görüntüsü
(Figure 4. The thermal image of the heat transfer to the other surface of the P25 sample and the temperature distribution on the surface)

5. SONUÇ VE ÖNERİLER (CONCLUSION AND RECOMMENDATIONS)

Yapılan deneysel çalışmalar ve bulgular neticesinde polimer kaplı ponza takviyeli P50 numunesinin diğer numunelere göre daha iyi ısıl yalıtım sağladığı tespit edilmiştir. Bu sonuçlar ışığında

üretilen polimer kaplı pomza takviyeli panellerin soğuk hava depoları için mahal ve dış duvarlarda yalıtım ve yapı malzemesi olarak kullanılabileceği görülmüştür. Polimer kaplı ponza takviyeli panellerin su yalıtımı ve yangına karşı dayanıklılıkları konusunda çalışmaların yapılabileceği düşünülmektedir.

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EMOTIONAL INTELLIGENCE TRAINING IN CONSTRUCTION PROJECTS

ABSTRACT

Recent research recognizes the importance of Emotional Intelligence (EI) in the Construction industry. Research on EI in Construction are predominantly quantitative to measure the relationship between EI and work-related factors. EI has suggested as underpinning a number of behaviors considered important for project management however, few studies have conducted to date examining whether training can improve EI. Insufficient empirical and theoretical attention has given to the influence of EI in determining performance and the mechanisms underlying this relationship among project team members in construction projects. This research explores the association between EI and construction project manager skills in the context of construction projects. To test the model, we collected data from 119-project manager in a construction project. The empirical results demonstrate that EI positively linked to construction manager skills. This paper concludes with a discussion of the research and practical implications of the study's findings, and suggestions for future research directions.

Keywords: Emotional Intelligence, Construction Project Management, Construction industry, Project Manager Skills, Traditional Project Management

1. INTRODUCTION

Over the past two decades the "human side" of project management has increasingly been identified as a critical component of the project manager's role associated with project management success [5]. Researchers have found that challenges in construction projects are largely associated with human skill and competencies, rather than technical issues. Human skill and competency are a critical part of managing large scale projects, influencing on successful delivery of projects. Researchers such as Mazur, et al., (2014), Müller and Turner, (2010) and Rezvani, et al., (2016) have revealed that behavioural skills and competencies, more specifically emotional intelligence (EI), defined by Mayer, et al., (2008) as the ability to be aware of, to manage, and to understand emotions in self and others, can affect the outcomes of major projects. Rezvani, et al., (2016) and Mazur, et al., (2014), for instance, found that managers with high levels of EI are more motivated to become involved in effective communications and are more creative regarding complex tasks, resulting in increased chances of project success in major projects [15, 17, 20 and 31].

Past research has shown the importance of EI to the achievement of successful outcomes, the project management literature is replete with unsubstantiated generalizations, with much of the existing evidence bearing on the role of EI for project managers [4, 15 and 17]. Therefore, our first goal is to extend research in the field of EI to research in construction projects [20 and 29]. Our focus in this

research lies in construction project environments due to their major influence on our society by supporting its foundation. In addition, prior research has indicated the relevance of EI to construction projects and project performance [15, 17 and 20]. The overarching research question for this study is as: Does training in Emotional Intelligence concepts improve an individual's Emotional Intelligence scores?.

2. RESEARCH SIGNIFICANCE

This research explores the association between EI and construction project manager skills in the context of construction projects. To test the model, we collected data from 119-project manager in a construction project. The empirical results demonstrate that EI positively linked to construction manager skills. This paper concludes with a discussion of the research and practical implications of the study's findings, and suggestions for future research directions.

3. LITERATURE REVIEW

In recent years, a number of researchers have studied the dimensions of emotional intelligence associated to behaviours at work. Some of these studies show a significant association between emotional intelligence and behaviours related to construction project management. The level of emotional intelligence of the project manager directly related to the success of construction projects. The success of the project, however, is not something easy to define. Behavioural skills, including interpersonal competencies, is one of the three pillars of project management capable of enabling the project manager, a clearer picture of the situation to be treated. Research has demonstrated the importance and relevance of soft skills such as EI for the successful of construction projects, which appears to be a particularly appropriate setting in which to examine issues related to relationships involving EI [32]. Existing research has highlighted the significance of EI in achieving successful outcomes [13, 14 and 15]. More recently, the number of studies about interpersonal competencies to project management has grown significantly, mostly out of the works relating positively the interpersonal competencies with the success of projects, suggesting a direct relationship between these two factors [34]. Allied to this, Turner and Müller (2005) and Sunindijo, et al., (2007a) indicate emotional intelligence as an important component to influence the leadership style of construction project managers, contributing positively to interpersonal skills. In other words, there would be also a direct relationship between emotional intelligence and skills of the manager [23 and 30].

Goleman (1998) has proposed that individuals who possess a high degree of EI can positively influence both team and organizational performance [8]. Some preliminary research within construction has revealed this to be the case [22]. Often, EI is considered to be mistakably synonymous with simply having good social skills such as good interpersonal and communication skills [26]. As noted above, such skills have identified as being fundamental for construction managers, as they deal with an array of people at various levels such as clients, consultants, subcontractors and suppliers on a daily basis. EI, however, extends beyond simply possessing social skills. Being emotionally intelligent involves being actively able to identify, understand, process and influence one's own emotions and those of others to guide feeling, thinking and action. Individuals who possess a high degree of EI are able to make informed decisions, better cope with environmental demands and pressures, handle conflict in an

effective manner, communicate in interesting and assertive ways and make others feel better in their work environment.

For construction project managers' who constantly confronted with solving disputes and general problems during pre and post construction, an ability to formulate satisfactory solutions is essential. Construction managers who have a positive mood toward problem solving will invariably evaluate things more positively than those who have a negative mood. Negotiations, for example, between a contractor and a client's representative with respect to a claim can be highly emotional charged situations for both parties, especially when substantial financial investments are at stake. The negotiation process is fraught with emotion, and emotional relationships and contingent interactions can all affect upon the outcome. Thus, when entering negotiations or solving problems on-site with team members or subcontractors it is important that construction project managers are cognizant that their emotional standing can influence their mood and those around them [12].

Among the first to work with the concept of emotional intelligence linked to the project environment, Turner and Müller (2005) present in their work a discussion of the project manager's leadership style including emotional intelligence, as one of the success factors of the project itself. They indicate emotional intelligence as an important component to influence the leadership style of project managers. Butler and Chinowsky (2006) have found a significant relationship between EI and transformational leadership behaviour among construction executives [2]. Mount (2006) assessed the skills related to the success of project managers in 74 international petroleum corporations, and found that, of all the skills that contributed to project managers' success, 69% were the emotional competencies [16]. Barry and Plessis (2007), emotional intelligence is portrayed as a critical element for project managers, an issue validated through research in which the managers themselves recognise this importance [1]. Sunindijo, et al., (2007a) conducted a survey with the project managers of the construction sector and found that emotional intelligence contributes positively to the considered key competences in the project management activities, such as communication and conflict management [23]. Pant and Baroudi (2008) asserted that the tacit knowledge, such as subjective, cognitive, and experiential learning, was closely linked to emotional intelligence. Turner and Lloyd-Walker (2008) reported that emotional intelligence capabilities greatly contribute to project success. Another study by Geoghegan and Dulewicz (2008) was carried out to identify whether a significant relationship existed among emotional quotient dimensions (self-awareness, sensitivity, influencing, and motivation) and project success [7, 18 and 24]. Having analysed the data gathered from 52 project managers in the United Kingdom, the researchers found a significant relationship between EQ dimensions and project success.

Davis (2011) relates the communication skills, conflict management, motivation ability, and problem solving to emotional intelligence [6 and 25]. Clarke (2010) also points out a strong relationship between emotional intelligence and a project manager's interpersonal skills [4]. Yang, et al., (2011) found that teamwork exhibited significant influence on project performance, whereas teamwork is an emotional intelligence competency included in the emotional intelligence competency model [33]. Mazur, et al., (2014) examined the relationship between EI and project success from the perspective of project managers. The researchers argue that emotionally intelligent project managers are more likely to communicate effectively and participate in problem-solving activities

with stakeholders. Zhang, et al., (2013) found that Chinese construction project managers considered eight emotional intelligence competencies to be important for the successful management of their projects. These included empathy, inspirational leadership, teamwork and collaboration, conflict management, influence, change catalyst, service orientation, and organizational awareness. Sunindijo and Hadikusumo (2014) in their study of project manager's emotional intelligence and its effect on conflict resolution discovered that project managers with high levels of emotional intelligence verses project managers with lower levels, were able to more readily adjust their conflict resolution style when conflict was present in order to appropriately diffuse potentially damaging situations. This field study of emotional intelligence as a moderator of conflict in construction is a good example of the benefits of emotional intelligence for mitigating the effects of relationship conflict. Trejo (2014) works with the relationship between emotional intelligence and results of term, cost, and project scope finding positive contributions of emotional intelligence in these components. Sunindijo (2015) reported that emotional intelligence has a significant influence on project cost performance and project quality performance [28]. Stephens and Carmeli (2016) argue that individuals with high levels of EI expand their knowledge and skill bases to improve their ability to communicate and cooperate effectively for successful project outcomes [21]. Rezvani, et al., (2016) conducted their study on the Australian defence industry and reported the significant relationship between project managers' emotional intelligence and project success with the mediation role of job satisfaction and trust.

4. METHODS

The research documents the impact of integrating an emotional intelligence curriculum and its influence on intrapersonal and interpersonal skills to improve leadership and team performance effectiveness in construction managers. Both the experimental group and the control group completed the EI pre-assessment. A two-week intervention was scheduled and delivered to the experimental group while the control group received the standard curriculum.

The variables in the study included four dimensions with a combined 13 emotional intelligence skills from the Emotional Skills Assessment Process. However, the study only focused on Intrapersonal Dimension, Interpersonal Dimension and Leadership Dimension as the dependent variables. The variables from the Team Member Effectiveness instruments were team satisfaction, team cohesiveness, team effectiveness as dependent variables. Emotional intelligence served as the independent for the study. The purpose of the research was to explore the impact of emotional intelligence on leader behavior and team effectiveness. The purpose of the EI treatment intervention was to assist managers with developing strategies to discover the value and importance of using emotions intelligently to achieve success in all areas of construction project.

The research participants were composed of 53% male and 41% female managers (6% missing data). The mean age of the participants was 33. Participants divided into an experimental group and a control group. The experimental group received the EI intervention while the control group received the traditional project management curriculum. The data collection based on archival data collected from an assurance of learning pilot program in fall 2019. The focus of the pilot was to explore ways to enhance managers' skills by integrating an emotional intelligence intervention into the Project Management Concepts course.

The researchers created the pilot design and concepts of the pilot program. An experimental design implemented to collect the data and test if an in-course intervention would improve individual manager skills. The researcher was an active participant in the program by administering the pre and post assessments.

5. RESULTS

5.1. Numerical Results

The purpose of the quantitative experimental study was to investigate the influence of the EI intervention to improve construction manager's intrapersonal and interpersonal skills to impact leader behavior. The goal of the research was to increase construction managers' post EI scores in specific skill areas of intrapersonal skills and interpersonal skills to their ability to lead and work effectively in a team environment. The statistical analyses based on 119 construction managers enrolled in four sections of the project management concepts course to measure the impact of the EI intervention on three of the five dimensions prescribed in the EI Post-test. Table 1 shows the mean EI score of construction managers in the experimental group who completed the Intrapersonal Dimension, the Interpersonal Dimension, and the Leadership Dimension of the EI Post-test. The results revealed that total EI scores average 327.12 with a standard deviation 37.03. Interpersonal Dimension average scores of 84.92 with the standard deviation of 12.6 were the highest of the three dimensions. The Leadership Dimension average score of 81.69 with the standard deviation of 9.4 indicating the mid-range of the three dimensions. Construction managers scored on average of 78.86 with a standard 85 deviation of 14 for the Intrapersonal Dimension indicating the lowest of the three dimensions listed.

Table 1. Descriptive statistics EI Skills Post-test (Experimental Group)

Skills	Means	Standard Deviation
Total Leadership	76.05	11.4
Total Intrapersonal	76.23	12.6
Total Interpersonal	79.55	12.0
Total EI Score	309.30	39.03
Team Cohesiveness	11.99	2.15
Individual Satisfaction	12.08	2.96
Total Team Satisfaction	47.41	8.45

Hypothesis 1 suggested that the mean EI scores would increase from the pre-test to post-test for the experimental group but not for the control group. As shown in Table 2, results of a dependent samples t-test revealed that the control group's Total EI scores did not significantly increase from pre-test (M=317.06, SD=28.66) to post-test (M=317.28, SD=27.53), t(17)=-.04, p=.97. In contrast, the experimental group's scores increased significantly from pre-test (M=310.03, SD=39.436) to post-test (M=331.81, SD=38.15), t(73)=-6.33, p=.000. Thus, Hypothesis 1 supported.

5.2. Finding

The research designed to investigate the influence of Emotional Intelligence Management Concepts Curriculum to improve construction manager's intrapersonal and interpersonal skills to impact leader behavior and team performance effectiveness. The purpose of the research was to explore the significant of emotional intelligence and its impact on leader behavior and team effectiveness through intrapersonal and interpersonal skills, so construction managers would

embrace the emotional mind as well as the cognitive mind to minimize conflict, increase project success, and establish healthier relationships. The study utilized the quantitative research method with an emphasis on quasi-experimental non-equivalent groups to collect and analyze data to examine the research questions for this study. Hypothesis 1 supported that the mean EI scores would increase from the pre-test to post-test for the experimental group but not for the control group. The mean for the EI post-test assessment indicated that the emotional intelligence level of the participants in the experimental group did increase significantly. This significant increase suggested participants in the experimental group made a positive change and connection between emotional intelligence skills and their emotional mind. The participants appeared to be more self-aware and comfortable with themselves and others around them. Participants seem to have discovered that they do have control over their emotions. The experimental group also appeared to have understood the value of self-directing their emotions from reflecting on past emotions and outcomes to create a better present interaction. The group was able to visualize and process the emotional learning system to understand the difference between a thought and a feeling. The results also explained the participants' growth and development in their personal exchange from the beginning of the EI intervention to the end. In contrast, the control group scores did not change from pre-test to post-test indicating that the participants in the control group might benefit from the EI intervention.

6. DISCUSSION

This study analysed the effects of emotional intelligence skills of construction managers participated in four sections of the Management Concepts course to investigate the impact of the EI intervention to increase construction manager's intrapersonal and interpersonal skills to improve their leader behaviour skills and team effectiveness. The EI intervention was successful. The intervention designed to enable construction managers to recognize, understand, and manage their emotions by utilizing the emotional learning system. EI made a significant difference between the EI pre and post scores with a 21-point increase.

The findings suggested team members in the experimental group displayed evident of incorporating emotional intelligence into their interaction with each other and it proved to be vital to their team success. The EI intervention proved that the experimental group was able to connect with their team members and had a better team experience than the control group. Construction managers will be more emotionally in tone with learning and will perform better in their projects and on team projects [12]. In support of these results, Kang, et al., (2018), Castañeda, et al., (2005), Torres-Machí, et al., (2013), and Harris, et al., (2020) revealed the significance of identifying, understanding and managing emotions through some type of skills training program [3, 9, 10 and 27].

This research showed that specific skills such as assertion, comfort, empathy, decision-making, leadership, drive strength, time management, commitment ethics, self-esteem, and stress management could develop in a training setting. The second phase of the research divided the participants into teams to form both the experimental and control groups. The results revealed that there was a statistically significant between total EI scores and team effectiveness. Individuals high in emotional intelligence performed better on a team [19].

Members who were more social aware and comfortable with their teammate bonded better than those who were not. Team members that create cohesive relationships had positive results [11]. The results also indicated that teams with more cohesive relationship and individuals connecting to their cognitive and emotional skills had less stress and conflicts.

7. CONCLUSION

The research designed to investigate the influence of Emotional Intelligence Management Concepts Curriculum to improve construction manager's intrapersonal and interpersonal skills to impact leader behavior. The purpose of the research was to explore the significant of emotional intelligence and its impact on leader behavior through intrapersonal and interpersonal skills, so construction managers would embrace the emotional mind as well as the cognitive mind to minimize conflict, increase project success, and establish healthier relationships.

The data generated from the research study provides a unique collection of data that resulted from the integration of the EI intervention into the Construction Management Concepts that did not previously exist. The research revealed that the EI intervention could integrated into a PBO curriculum to develop and improve the emotional learning process through a transformative education and skill-based approach to increase awareness and promote emotional self-control and healthy relationships. Introducing EI, skills offer positive advantages to project and career success.

The findings suggest that teaching construction managers to use both the emotional and cognitive learning attributes are important for authentic learning to happen. The study charts an opportunity for improving both the cognitive and the emotional mind to increase project performance and enhance personal and social interactions. The EI intervention could serve as a direct link to team effectiveness.

This research is a preliminary study, which may improve in a number of ways. Based on the investigation of the research to identify the effects of the EI intervention to improve construction managers' intrapersonal and interpersonal skills, the results of the hypotheses testing strongly supported the effectiveness of the EI intervention. This study can replicate in other project and disciplines, and countries. Regarding to hypothesis 5 that not supported that there would be a positive relationship between EI leader behavior scores and individual team satisfaction, more research needed to clarify the empathy scale relative to leadership to address the potential curvilinear rather than a linear construct.

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TORNALAMA İŞLEMİNDE İŞLEME PARAMETRELERİNİN Ti-6Al-4V ALAŞIMININ YÜZEY KALİTESİ ÜZERİNE ETKİSİNİN ARAŞTIRILMASI

ÖZ

Titanyum ve alaşımları sahip olduğu düşük termal iletkenlik ve yüksek mukavemet sebebiyle kesici takım ile iş parçası arasında yüksek sıcaklıklar meydana gelmekte ve talaş oluşumunu sağlayan plastik deformasyonun gerçekleşmesi zorlaşmaktadır. Öte yandan artan sıcaklıkla birlikte iş parçası ile kesici takım arasında kimyasal tepkimeler gerçekleşmekte ve sonuç olarak iş parçası kesici takımın yüzeyine yapışmakta ve hızla aşınarak işlenen yüzeyin kalitesini düşürmektedir. Titanyum alaşımlarının kullanım alanları da düşünüldüğünde yüzey kalitesi büyük önem arz etmektedir. Bu yüzden titanyum alaşımlarının işlenmesi sırasında işleme parametrelerinin optimize edilerek yüzey kalitesinin artırılması gerekmektedir. Bu çalışmada Ti6Al4V alaşımından imal edilmiş çubuk şeklindeki iş parçaları farklı seviyelerdeki, kesme hızı, talaş derinliği ve ilerleme miktarı değerlerinde kuru tornalama işlemine tabi tutulmuş ve işleme parametrelerinin, yüzey pürüzlülük değeri üzerindeki etkileri incelenmiştir. Elde edilen sonuçlar varyans analizi (ANOVA) yöntemiyle irdelenmiş ve her bir parametrenin istatistiksel etkileri tespit edilmiştir.

Anahtar Kelimeler: Ti6Al4V, Yüzey kalitesi, ANOVA, Süperalaşımlar, Tornalama

INVESTIGATION OF THE EFFECT OF MACHINING PARAMETERS ON SURFACE QUALITY OF Ti-6Al-4V ALLOY IN TURNING PROCESS

ABSTRACT

Due to the low thermal conductivity and high strength of titanium and its alloys, high temperatures occur between the cutting tool and the workpiece, and plastic deformation that causes chip formation becomes difficult. On the other hand, with increasing temperature, chemical reactions take place between the workpiece and the cutting tool, and as a result, the workpiece adheres to the surface of the cutting tool and wears down rapidly, reducing the quality of the machined surface. Considering the usage areas of titanium alloys, surface quality is of great importance. Therefore, it is necessary to increase the surface quality by optimizing the machining parameters during the machining of titanium alloys. In this study, bar-shaped workpieces made of Ti6Al4V alloy were subjected to dry turning at different levels, cutting speed, depth of cut and feed rate, and the effects of machining parameters on the surface roughness value were investigated. Obtained results were analyzed by analysis of variance (ANOVA) method and statistical effects of each parameter were determined.

Keywords: Ti6Al4V, Surface Quality, ANOVA, Superalloys, Turning

1. GİRİŞ (INTRODUCTION)

Teknolojideki gelişmelerle birlikte makine elemanlarından beklenen özellikler de artmıştır. Özellikle imalat teknolojilerindeki gelişmeler makine parçalarından beklenen kalite ve performans gibi özelliklere yönelik beklentileri yükseltmektedir. Bir mühendislik parçasının mekanik özelliklerinin yanı sıra yüzey kalitesi de ayırt edici hale gelmiştir. Bir mühendislik parçasının yüzey kalitesi sadece kendi kullanılabilirliğini değil tüm makine performansını yakından etkilemektedir. Havacılık, uzay, biyo-medikal ve otomotiv gibi yüksek teknolojinin kullanıldığı sektörlerde yüksek dayanım ve düşük yoğunluğa sahip malzeme arayışları giderek artmaktadır [1]. Titanyum ve alaşımları düşük yoğunluğun yanı sıra yüksek dayanım, ısıl direnç ve korozyon dayanımı gibi özellikleri barındırdığı için bu beklentilerin büyük bölümünü karşılamaktadır [2]. Titanyum alaşımları sahip olduğu bu üstün özellikler sayesinde biyo-medikal sektöründe vücut içi implant, ameliyat ekipmanlarının imalatı; havacılık sektöründe jet motorlarının kanatçıklarının imalatı gibi yüksek teknolojinin kullanıldığı birçok noktada kullanılmaktadır [3, 4, 5 ve 6]. Bu elemanların çalışma koşulları incelendiğinde yüzey kalitelerinin de oldukça yüksek olması gerekmektedir. Kompresör kanatçıklarının yüzey kalitesi, aerodinamik açıdan sistemin verimini önemli ölçüde etkilemektedir [7], vücut içi implantların yüzey kalitesi ise biyo uyumluluk ve korozyon direnci üzerinde önem arz etmektedir [8].

Titanyum alaşımlarının sahip olduğu bu üstün özellikler, işlenebilirlik açısından birtakım sorunları da beraberinde getirmektedir. Malzemenin sahip olduğu düşük ısıl iletim katsayısı ve yüksek dayanım sebebiyle kesici takım ile iş parçası ara yüzeyinde yüksek miktarda ısı açığa çıkmakta ve plastik deformasyon zorlaşmaktadır. Öte yandan artan ısıyla birlikte kimyasal tepkimeler ve iş parçası malzemesinin takıma kaynaması gerçekleşmekte ve takım hızla aşınarak yüzey kalitesini düşürmektedir [9]. Bu sebeple titanyum alaşımın işlenmesinde işleme parametrelerinin seçim ve optimizasyonu büyük önem arz etmektedir. Titanyum alaşımlarının tornalanması üzerine yapılan çalışmalar aşağıda özetlenmiştir.

Cakir ve ark., çalışmalarında Ti-6Al-4V alaşımının ultrasonik destekli tornalama yöntemiyle işlenebilirliğini sonlu elemanlar yöntemiyle araştırmışlardır. Simülasyon sonuçlarını daha önceki deneysel çalışmalardan elde edilen sonuçlarla kıyaslamışlardır. Çalışma sonucunda ultrasonik desteğinin kesme kuvvetleri açısından avantaj sağladığı görülmüştür. Öte yandan ultrasonik destekli tornalama işleminde maksimum sıcağın daha yüksek değerlere ulaştığı ancak periyodik olarak devam eden vurum ara süresi boyunca takımın soğuma fırsatı bulduğunu da değinilmiştir [10].

Venugopal ve ark., Ti-6Al-4V alaşımını kreyojenik şartlarda işlemişlerdir. Sıvı nitrojen kullanılarak soğutulan işleme ortamında takım aşınmaları incelenmiş ve diğer işleme ortamları ile karşılaştırılmıştır. Sonuç olarak hem krater aşınması hem de yanak aşınmasında en iyi sonucun kreyojenik ortamda sağlandığı tespit edilmiştir [11].

Pan ve ark., Ti-6Al-4V alaşımının işlenmesinde kesme kuvvetlerinin malzeme mikroyapısına bağlı olarak bir modelini geliştirmişlerdir. Geliştirilen modelle birlikte işlenebilirlik ve takım aşınması gibi çıktılar tahmin edilebilirken düşük maliyetle yüksek oranlı üretim yapma imkânı sağlanmıştır [12].

Muthuswamy ve ark., yüksek hızlarda Ti-6Al-4V alaşımının işlenebilirliğini ve takım aşınmalarını incelemişlerdir. İşleme parametrelerinin etkilerinin ANOVA analizi ile irdelendiği çalışmada yüzey pürüzlülüğü üzerinde en önemli etkinin ilerleme miktarı olduğu,

kesme kuvvetleri için ise sırasıyla ilerleme miktarı, kesme derinliği ve kesme hızı olduğu tespit edilmiştir [13].

2. ÇALIŞMANIN ÖNEMİ (RESEARCH SIGNIFICANCE)

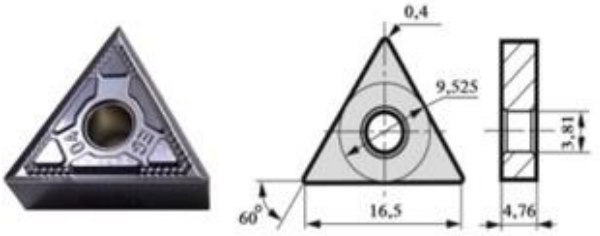
Bu çalışmada Ti-6Al-4V alaşımında imal edilmiş iş parçaları 3'er farklı kesme hızı, ilerleme miktarı ve kesme derinliği parametrelerinde kuru tornalama işlemine tabi tutulmuş ve parametrelerin ortalama yüzey pürüzlülüğü (Ra) üzerindeki etkileri incelenmiştir. Her bir parametrenin Ra üzerindeki istatistiksel etkisi ise Varyans Analizi (ANOVA) yöntemiyle irdelenmiştir.

3. DENEYSEL ÇALIŞMA (EXPERIMENTAL STUDY)

Deneylerde iş parçası olarak Ti-6Al-4V alaşımından imal edilmiş 100x Ø10 mm ölçülerindeki çubuklar kullanılmıştır. Ti-6Al-4V alaşımının kimyasal içeriği Tablo 1'de verilmiştir. Deneylerde TNMG160404N-EG geometrisine sahip Sumitomo Electric firması tarafından süperalaşımların işlenmesi için özel olarak üretilen AC5025S serisi kesici takımlar kullanılmış olup takım geometrisi Şekil 1'de görülmektedir. Kesici takımlar her deney sonrasında değiştirilmiş ve MTJNR 2020 K16 kodlu takım tutucuya bağlanarak tornalama işlemleri gerçekleştirilmiştir.

Tablo 1. Ti-6Al-4V alaşımının kimyasal bileşimi
(Table 1 Chemical compunds of Ti-6Al-4V alloy)

Al	V	C	Fe	O	N	H	Ti
%5.5-6.5	%3.5-4.5	%0.08 maks	%0.25 maks	%0.20 maks	%0.05 maks	%0.015 maks	Kalan

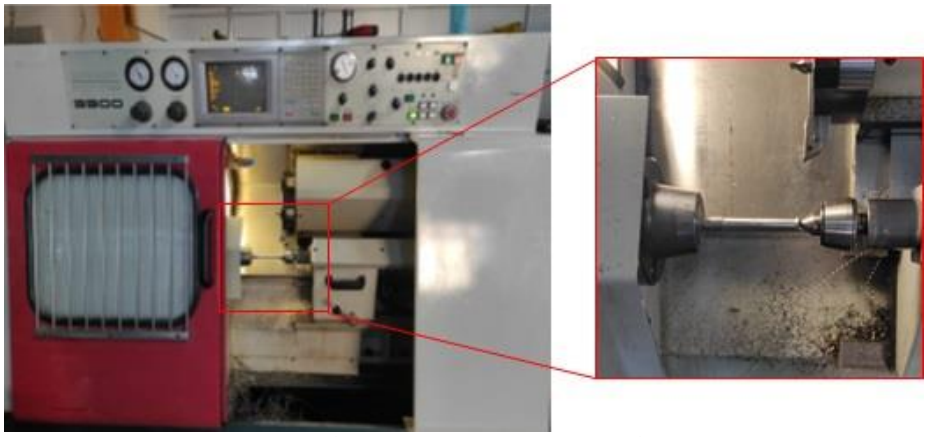


Şekil 1. Deneylerde kullanılan kesici takım
(Figure 1. Cutting tool used in the experiments)

Deneyler DYNA MYTE 3300 model CNC torna tezgahı aracılığıyla gerçekleştirilmiştir. Numuneler, hidrolik ayna ve karşılık puntası arasına bağlanarak işlenmiştir (Şekil 2). Deneylerde kesme hızı, ilerleme miktarı ve talaş derinliği faktörleri değişken olarak belirlenmiştir. Her bir faktör 3'er seviyede değiştirilmek üzere tam faktöriyel deneysel tasarım yöntemi kullanılarak toplam 27 deney gerçekleştirilmiştir. Deney parametreleri takım imalatçı firmanın önerileri doğrultusunda belirlenmiş olup Tablo 2'de görülmektedir. Deneyler sonrasında numunelerin yüzey pürüzlülük değerleri Accretech HandySurf 35+ taşınabilir bir ölçüm cihazı yardımıyla 10mm örnekleme uzunluğunda ölçülmüştür. Her numuneden 120° aralıklarla 3 farklı ölçüm alınmış ve bu ölçümlerin aritmetik ortalaması ortalama yüzey pürüzlülüğü olarak kabul edilmiştir. İşlenmiş numunelere ait görüntüler Şekil 3'te görülmektedir.

Tablo 2. Deney parametreleri ve faktör seviyeleri
(Table 2. Experimental parameters and factor levels)

Parametre	Seviye 1	Seviye 2	Seviye 3
Kesme Hızı (m/dak)	20	40	60
İlerleme Miktarı (mm/dev)	0.1	0.2	0.3
Talaş Derinliği (mm)	0.5	0.75	1
İşleme Ortamı	Kuru işleme		
İşleme Uzunluğu (mm)	70		



Şekil 2. Deney düzeneği
(Figure 2. Experimental setup)

Şekil 3. İşlenmiş numuneler
(Figure 3. Machined specimens)

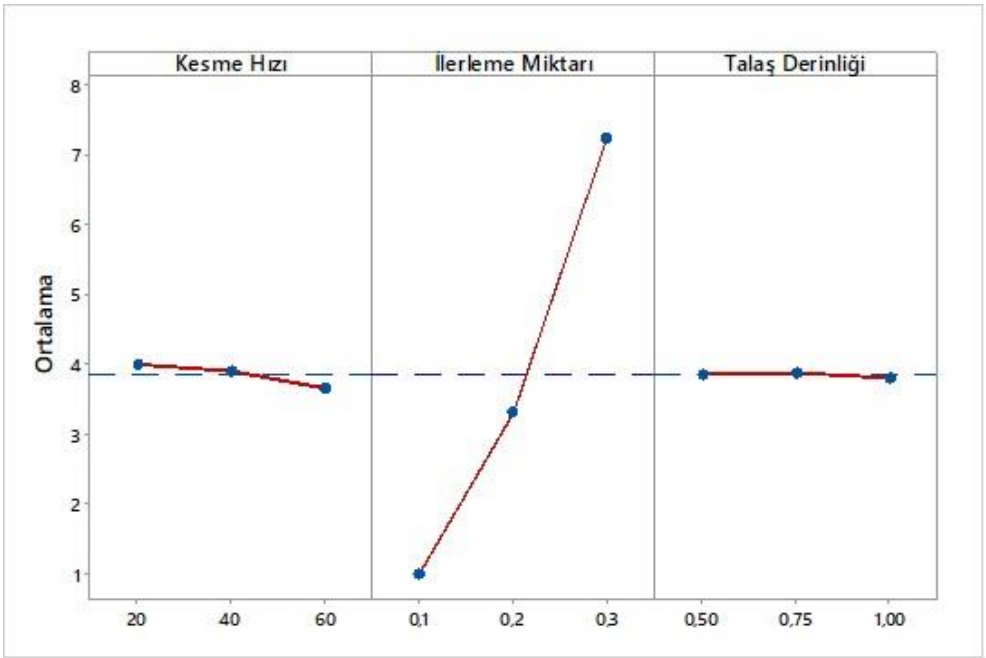
4. DENEYSEL SONUÇLAR (EXPERIMENTAL RESULTS)

Deneyler sonrasında numunelerden alınan ölçümler sonucu hesaplanan ortalama yüzey pürüzlülük değerleri Tablo 3'te verilmiştir. Tablo incelendiğinde Ra değerlerinin 0.913µm ile 7.812µm gibi geniş bir aralıkta değiştiği görülmektedir. Parametrelerin Ra değerleri üzerinde ortalama etkilerini göstere grafik Şekil 4'te verilmiştir. Grafikteki mavi kesikli çizgi tüm deneyler sonucu elde edilen Ra değerlerinin ortalaması olan 3,858 µm değerini göstermektedir. Grafikten de görüldüğü üzere kesme hızındaki artış Ra değerlerinde bir azalmaya sebebiyet vermektedir. Bu durum artan kesme hızıyla birlikte takım talaş ara yüzeyindeki sıcaklığın artarak plastik deformasyon işlemini kolaylaştırması ile açıklanabilir [14].

İlerleme miktarındaki artış ortalama yüzey pürüzlülüğünde ciddi artışlara sebep olmaktadır. Tüm deneylerde ilerleme miktarının 1. seviyesi olan 0.1mm/dev seviyesinde Ra değeri ortalaması 1.008µm iken bu değer 2. seviye olan 0.2mm/dev değerinde %228 oranında artarak 3.312µm olmaktadır. İlerleme miktarının 0.3mm/dev değerinde ise Ra değerler ortalaması bir önceki seviyeye göre %119 artarak 7.255µm olmaktadır. İlerleme miktarı parametresinin özellikle kesme kuvvetleri üzerinde önemli bir etkiye sahiptir [13]. Yüzey pürüzlülüğündeki bu artış da talaşlı imalat sürecinde kesme kuvvetlerindeki artışla bağdaştırılabilir. Talaş derinliğinin artması birim zamanda kaldırılacak talaş miktarının artması anlamına gelmektedir. Bu durum takıma etkiyen mekanik ve termal yüklerin artmasına ve bunun neticesinde yüzey kalitesinin de azalmasına neden olmaktadır.

Tablo 3. Deneysel tasarım ve ölçüm sonuçları
(Table 3. Experimental design and measurement results)

Deney No	Kesme Hızı	İlerleme Miktarı	Talaş Derinliği	Ra
1	20	0.1	0.5	0.913
2	20	0.1	0.75	1.100
3	20	0.1	1	1.077
4	20	0.2	0.5	3.378
5	20	0.2	0.75	3.409
6	20	0.2	1	3.547
7	20	0.3	0.5	7.381
8	20	0.3	0.75	7.812
9	20	0.3	1	7.467
10	40	0.1	0.5	1.051
11	40	0.1	0.75	0.934
12	40	0.1	1	1.024
13	40	0.2	0.5	3.461
14	40	0.2	0.75	3.335
15	40	0.2	1	3.367
16	40	0.3	0.5	7.609
17	40	0.3	0.75	7.456
18	40	0.3	1	6.914
19	60	0.1	0.5	0.923
20	60	0.1	0.75	0.948
21	60	0.1	1	1.106
22	60	0.2	0.5	3.136
23	60	0.2	0.75	3.115
24	60	0.2	1	3.059
25	60	0.3	0.5	6.987
26	60	0.3	0.75	6.847
27	60	0.3	1	6.818



Şekil 4.Faktörlerin ortalama etki grafikleri
(Figure 4. Mean effect graph of the factors)

Faktörlerin Ra üzerindeki istatistiksel etkilerini görebilmek için deney sonuçları varyans analizi (ANOVA) yöntemiyle irdelenmiştir. ANOVA sonucu elde edilen değerler Tablo 4'te verilmiştir. Tablo incelendiğinde sadece İlerleme miktarı faktörünün P değerinin anlamlılık düzeyi olan 0.05 den daha küçük olduğu ve dolayısıyla sadece ilerleme miktarı faktörünün Ra üzerinde istatistiksel olarak anlamlı bir etkiye sahip olduğu görülmektedir. Öte yandan RA üzerindeki en büyük katkının ise yine %99.25 oranıyla ilerleme miktarı faktörü olduğu görülmüştür.

Tablo 4. ANOVA sonuçları
(Table 4. ANOVA results)

Faktör	Serbestlik Derecesi	SS Toplamı	F Değeri	P Değeri	% Katkılar
Kesme Hızı	2	0.580	0.04	0.962	0.32
İlerleme Miktarı	2	179.593	1583.34	0.000	99.25
Talaş Derinliği	2	0.021	0.00	0.999	0.01
Error	21	362.669	-		0.42
Total	27	542.863	-		100

5. GENEL SONUÇLAR (GENERAL CONCLUSIONS)

Bu çalışmada, Ti-6Al-4V alaşımının kuru tornalanmasında kesme hızı, ilerleme miktarı ve talaş derinliği faktörlerinin ortalama yüzey pürüzlülüğü üzerindeki etkileri deneysel olarak incelenmiştir. Takım üreticisi firmanın katalogda yer alan tavsiyeleri doğrultusunda planlanan deneysel tasarım sonucunda özellikle ilerleme miktarındaki artışın yüzey kalitesini çok fazla düşürdüğü görülmüştür. Sonuç olarak ortalama yüzey pürüzlülüğü açısından en iyi sonucu kesme hızı faktörünün 3. seviyesinde ilerleme miktarı faktörünün ve talaş derinliği faktörünün 1. seviyelerinde verdiği tespit edilmiştir. ANOVA sonuçları da göz önüne alındığında sonuçların literatüre ve önceki çalışmalara paralellik gösterdiği görülmektedir.

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PALYATİF BAKIMDA HASTASI OLAN BİREYLERİN ÖLÜM ALGISI İLE SPİRİTÜEL İYİLİK HALİ ARASINDAKİ İLİŞKİ

ÖZ

Araştırma, palyatif bakımda hastası olan bireylerin ölüm algısı ile spiritüel iyilik hali arasındaki ilişkisinin değerlendirilmesi amacıyla tanımlayıcı olarak yapılmıştır. Araştırma örneklemini 166 hasta yakınını oluşturmuştur. Araştırma verileri; tanıtım formu spritüel iyi oluş ölçeği, ölümün kişisel anlamları ölçeği ile toplanmıştır. Araştırmadan elde edilen verilerin değerlendirilmesinde sayı ve yüzdelik, ortalama, Kruskall-Wallis testi, Mann-Whitney U, t testi, ANAOVA testleri kullanılmıştır. Hasta yakınlarının palyatif bakım hastalarının tanısının %34.9'nun serebro vasküler hastalık, %30.1'nin kanser, %20.5'nin demans olduğu saptanmıştır. Hastaların yakınlık dereceleri bakım vericilerin %53.0'nün çocukları olduğu belirlenmiştir. Hasta yakınları spiritüel iyi oluş ölçeği'nin toplam puanı 37.94±7.36, Ölümün Kişisel Anlamları Ölçeği'nin yok olma alt alanından 12.63±4.90, ölüm sonrası hayat alt alanından 7.10±2.62, motivasyon alt alanından 18.24±5.59 puandır. Spiritüel iyi oluş ölçek toplam puanı ile Ölümün Kişisel Anlamları alt boyutundan Yok Olma alt alanı ile pozitif yönlü, Ölüm Sonrası Hayat ve Motivasyon alt alanları arasında negatif yönlü anlamlı ilişki olduğu belirlenmiştir.

Anahtar Kelimeler: Palyatif Bakım, Ölüm Algısı, Manevi İyilik, Bakıcı, Hasta

THE RELATIONSHIP BETWEEN PERCEPTION OF DEATH AND SPIRITUAL WELL-BEING OF RELATIVES OF PATIENTS IN PALLIATIVE CARE

ABSTRACT

The research was conducted descriptively for the purpose of evaluating the relationship between perception of death and spiritual well-being of relatives of patients in palliative care. The research sample consisted of 166 patient relatives. Research data were collected with the introductory form, the spiritual well-being scale, and the personal meanings of death scale. In the evaluation of the data; number and percentage, mean, Kruskall-Wallis test, Mann-Whitney U, t test, ANAOVA tests were used. It was determined that Diagnosis of palliative care patients' relatives 34.9% were cerebrovascular disease, 30.1% were cancer, and 20.5% were dementia. The degree of closeness of the patients was determined to be the children of 53.0% of the caregivers. The total score of the patient relatives' spiritual well-being scale was 37.94±7.36, the personal meanings of death scale was 12.63±4.90 from the extinction sub-domain, 7.10±2.62 from the life after death sub-domain, motivation subfield score was 18.24±5.59.It was determined that there was a positive correlation between the Spiritual Well-Being Scale total score and the Personal Meanings of Death sub-dimension, and a positive and negative relationship between the Life After Death and Motivation sub-domains.

Keywords: Palliative Care, Perception of Death, Spiritual Well-Being, Caregiver, Patient

1. GİRİŞ (INTRODUCTION)

Palyatif bakım bir bakım felsefesi ve yüksek derecede yapılandırılmış, organize edilmiş bakım verme biçimi olarak görülmektedir [1]. Günümüz koşulları göz önüne alındığında; toplumun sosyal yapısındaki değişiklik, yaşlı nüfus oranında artış, tıp alanındaki gelişmeler sonucu hastalıkların kronik bir süreç kazanması, hane nüfus sayısında azalma, kadınların ev dışında çalışma oranında artış gibi çeşitli gerekçelerle, kronik süreçteki hastalara aileleri gerekli bakımı sağlayamamakta ve profesyonel bakım ihtiyacı doğmaktadır. Palyatif bakım, tam da bu noktada, yaşamı tehdit eden bir hastalıkla yüz yüze kalan hasta ve yakınlarının, gereksinimlerinin karşılanması amacıyla doğmuş bir yaklaşım türüdür [2]. Spiritüalite, yaşam boyu kazanılan bilgiler ile bireyin kendisi ve diğer insanlarla olan ilişkilerini, evrendeki yerini, yaşamın anlamını, anlama ve kabul etme çabasıdır. Spiritüalite, dini içine alan fakat sadece din ile sınırlı olmayan, din kavramından daha geniş bir boyuta sahip, bireyin yaşamına anlam katan ve yaşamının amacını oluşturan öğeleri içermektedir [3 ve 4]. Spiritüel iyilik hali ise yaşamın amacını anlamaya çalışmak ve yaşamın daha büyük güçlerle paylaştığı bağlantıların farkına varmak gibi süreçleri içinde barındırmaktadır. Spiritüel iyilik hali yüksek olan bireyler, iç huzuru sağlayabilmekte, yaşamdan doyum alabilmekte ve daha başarılı olabilmektedir [4]. Bu çalışmada palyatif bakım sürecinin bakım vericilere yansıması ve konunun irdelenebilmesi hasta yakınlarının ölüme ilişkin algıları, spiritüel iyilik durumları, palyatif bakım uygulamaları, karşılaştıkları engeller ve ideal bir palyatif bakım için gereken uygulamaları hakkında bilgi edinilebilir.

2. ÇALIŞMANIN ÖNEMİ (RESEARCH SIGNIFICANCE)

Elde edilen sonuçlar doğrultusunda hasta yakınlarının palyatif bakım uygulamalarını etkileyebileceği düşünülen ölüm algılarının, spiritüel iyilik hali, palyatif bakıma ilişkin gereksinimlerinin belirlenmesi hedeflenmektedir. Araştırmada ulaşılan sonuçların palyatif bakım uygulamalarının niteliğin artırabilmek açısından literatüre katkı sağlayabileceği, hasta yakınlarının gereksinimlerine uygun eğitim programlarının düzenlenmesi ve kurumsal desteğin sağlanarak palyatif bakımın daha verimli hale getirilebilmesinde yol gösterici olabileceği öngörülmektedir.

3. MATERYAL VE METOT (MATERIAL AND METHOD)

Araştırma, palyatif bakım tedavisi alan hastalara bakım uygulayanların ve birinci derece yakınlarında Palyatif Bakımda Hastası Olan Bireylerin Ölüm Algısı ile Spititüel İyilik Hali Arasındaki ilişkisinin değerlendirilmesi amacıyla tanımlayıcı olarak yapılmıştır. Araştırma, Manisa İl Sağlık Müdürlüğüne Bağlı Şehir Hastanesi Palyatif Bakım Ünitesi, Geriatri Kliniğinde, 2020-2021 yılları arasında toplanmıştır. Araştırmada örnekleme yöntemine gidilmemiştir. Araştırmaya katılmaya gönüllü palyatif bakım hastalarının yakınları dahil edilmiştir, toplam 166 hasta yakınına ulaşılmıştır.

- **Dahil olma kriterleri**
  - Hastasının birinci derece yakını (anne, baba, eş, çocuk) olması
  - İletişim sorunu bulunmaması (Türkçe biliyor olması)
  - Araştırmaya katılmaya gönüllü olması
- **Dışlama kriterleri**
  - 18 yaş altında olması
  - Araştırmaya katılmayı kabul etmemesi
  - İletişim sorunu olması (Türkçe bilmiyor olması)

3.1. Araştırmanın Veri Toplama Araçları (Data Collection Tools of the Research)

3.1.1. Tanıtım Formu (Introduction Form)

Hasta yakınlarının sosyodemografik özelliklerini oluşturan sorulardan oluşmaktadır.

3.1.2. Spritüel İyi Oluş Ölçeği (SİOÖ) (Spiritual Well-Being Scale)

Ölçek, bireyin değerleri doğrultusunda hayatını anlamlandırmak için yetişkinlere yönelik olarak geliştirilmiştir [5]. Doğrulayıcı faktör analizinde 29 maddelik ölçeğin iç tutarlılık katsayısı (Cronbach's Alpha) ,886 olarak hesaplanmış ve oldukça yüksek olarak değerlendirilmiştir [5]. Bizim çalışmamızda ise, ölçeğin iç tutarlılık katsayı (Cronbach's Alpha) değeri .854 olarak bulunmuştur. Ekşi ve Kardaş'ın (2016) aktardığına göre ölçeğin 5'li likert olduğu göz önüne alınarak ölçek ortalama puanının 87 (29x3) olduğu varsayılırsa, 87 ve üzeri puanlarda spritüel iyi oluş düzeyi yüksek olarak değerlendirilmektedir. Bununla beraber 145 (29x5) puanlara yaklaştıkça spritüel iyi oluş düzeyinin çok daha iyi olduğu düşünülmektedir [5].

3.1.3. Ölümün Kişisel Anlamları Ölçeği (ÖKAÖ) (Personal Meanings of Death Scale)

Ölümün Kişisel Anlamları Ölçeği Cicirelli (1998) tarafından ölüme atfedilen anlamları ölçmek amacıyla geliştirilmiş olan bir ölçektir [6]. Ölçeğin Türkçe geçerlilik ve güvenilirlik çalışması 2005 yılında Koçanoğlu tarafından yapılmıştır [7]. Ölümün Kişisel Anlamları Ölçeği "Yok Olma", "Ölüm Sonrası Hayat" ve "Motivasyon/Geride Anlamlı Şeyler Bırakmak" olmak üzere 3 alt boyut ile 15 maddeden oluşan 5'li likert tipi bir ölçektir. Her maddeye verilen puanlar 1 ile 5 puan arasında değişmektedir. Bu ölçeğin maddelerine verilen cevaplar doğrultusunda "Kesinlikle Katılmıyorum=1 puan", "Katılmıyorum=2 puan", "Kararsızım=3 puan", "Katılıyorum=4 puan" ve "Kesinlikle Katılıyorum =5 puan" olarak değerlendirilmektedir. Ölçeğin bütününden elde edilecek bir toplam puan bulunmamaktadır. Alt boyutlardan elde edilen yüksek puan, bireylerin ölüme verdiği anlamı ifade etmektedir. Ölümün Kişisel Anlamları Ölçeği "Yok Olma" alt boyutu 5 maddeden (1., 2., 3., 6. ve 9. maddeler), "Ölüm Sonrası Hayat" alt boyutu 3 maddeden (7., 10. ve 12. maddeler) ve "Motivasyon/Geride Anlamlı Şeyler Bırakmak" alt boyutu 7 maddeden (4., 5., 8., 11., 13., 14. ve 15. maddeler) oluşmaktadır. Koçanoğlu'nun (2005) çalışmasında Ölümün Kişisel Anlamları Ölçeği'nin, Yok Olma alt boyutu Cronbach Alpha güvenirlilik katsayısı 0.78, Motivasyon/Geride Anlamlı Şeyler Bırakma Cronbach Alpha güvenirlilik katsayısı 0.72, Ölüm Sonrası Hayat Cronbach Alpha güvenirlilik katsayısı 0.82 ve ölçeğin genelinin Cronbach Alpha güvenirlilik katsayısı ise 0.67 olarak belirlenmiştir. Bu çalışmada Ölümün Kişisel Anlamları Ölçeği'nin, Yok Olma alt boyutu Cronbach Alpha güvenirlilik katsayısı 0.62, Motivasyon/Geride Anlamlı Şeyler Bırakma Cronbach Alpha güvenirlilik katsayısı 0.94, Ölüm Sonrası Hayat Cronbach Alpha güvenirlilik katsayısı 0.72 ve ölçeğin tamamının Cronbach Alpha güvenirlilik katsayısı ise 0.90 olarak saptanmıştır.

3.2. Veri Analizi (Data Analysis)

Araştırmadan elde edilen verilerin değerlendirilmesi bilgisayar ortamında SPSS for Windows 22.0 paket programı kullanılarak yapılacaktır. Verilerin değerlendirilmesinde ise sayı ve yüzdelik, ortalama, Kruskall-Wallis testi, Mann-Whitney U, t testi, ANAOVA testleri kullanılmıştır.

4. BULGULAR (RESULTS)

Palyatif bakımda hastası olan hasta yakınlarının sosyodemografik özelliklerine göre göre katılımcıların %53.0'ü 64 yaş ve üzeri, %47.0'si ise 63 yaş ve altındadır. Katılımcıların yaş ortalaması 63.09±18.37 olup en yüksek yaşın 94, en düşük yaşın ise 28 olduğu belirlenmiştir. Katılımcıların medeni durumu incelendiğinde 84.3'ünün evli olduğu, %37.3'nün ilkokulu mezunu olduğu, %26.5'nin okuma yazmasının olmadığı, %41.0'nin ilçede, %38.6'sının ilde yaşadığı, %69.9'nun gelirinin giderinden fazla olduğu, %25.3'nün gelirinin giderinden az olduğu, palyatif bakım hastalarının %72.3'nün eşiyle, %12.0'ı çocuklarıyla yaşadığı, saptanmıştır. Katılımcıların %31.3'ünün çalışmadığı, %19.3'ü işçi, %19.3'ü emekli olduğu, %81.9'unun bir işte çalışmadığı belirlenmiştir. Hasta yakınlarının palyatif bakım hastalarının tanısının %34.9'nun SVO, %30.1'nin kanser, %20.5'nin Demans, %14.5'nin diğer (Dekibütüs, KOAH, DM vb) olduğu saptanmıştır. Hastaların yakınlık dereceleri incelendiğinde bakım vericilerin %53.0'nün çocukları olduğu, %22.9'nun eşi olduğu, %15.6'sının diğer (kardeş, bakıcı, huzurevi personeli) olduğu saptanmıştır. Araştırma kapsamındaki katılımcıların %57 daha önce kayıp yaşadığı tespit edilmiştir.

Tablo 1. Palyatif bakımda hastası olan bireylerin SİOÖ ve ÖKAÖ puan ortalamaları
(Table 1. Means of SOOÖ and OCAO scores of individuals with patients in palliative care)

SİOÖ Alt Alanları	Ort±SS	Min	Max
Aşkınlık	61.49±14.60	15	75
Doğayla Uyum	29.95±5.65	8	35
Anomi	19.60±5.79	7	35
SİOÖ Toplam Puan	37.94±7.36	11.33	48.33
ÖKAÖ Alt Alanları	Ort±SS	Min	Max
Yok Olma	12.63±4.90	5	25
Ölüm Sonrası Hayat	7.10±2.62	3	15
Motivasyon	18.24±5.59	7	35

Tablo 1'de Palyatif bakımda hastası olan hasta yakınlarının SİOÖ ve ÖKAÖ'lerinin alt alanlarından aldığı puanların ortalamaları yer almaktadır. Hasta yakınları SİOÖ'nin Aşkınlık alt alanından 61.49±14.60 (Min=15; Max=75), Doğayla Uyum alt alanından 29.95±5.65(Min=8; Max=35), Anomi alt alanından 19.60±5.79 (Min=7; Max=35) puan almışlardır ve SİOÖ'nin Toplam ortalama puan 37.94±7.36 (Min=11.33; Max=48.33)'dür. Hasta yakınları ÖKAÖ'nin Yok Olma alt alanından 12.63±4.90 (Min=5; Max=25), Ölüm Sonrası Hayat alt alanından 7.10±2.62 (Min=3; Max=15), Motivasyon alt alanından 18.24±5.59 (Min=7; Max=35) puan almışlardır.

Tablo 2. Palyatif bakımda hastası olan bireylerin SİOÖ ve ÖKAÖ puanları arasındaki korelasyon
(Table 2. Correlation between SİOE and OCAO scores of individuals with patients in palliative care)

SİOÖ Alt Alanları		ÖKAÖ Alt Alanları		
		Yok Olma	Ölüm Sonrası Hayat	Motivasyon
Aşkınlık	r	0.338**	-0.609**	-0.448**
	p	0.00*	0.00*	0.00*
Doğayla Uyum	r	0.414**	-0.517**	-0.478**
	p	0.00*	0.00*	0.00*
Anomi	r	-0.347**	0.231*	0.324**
	p	0.00*	0.03**	0.00*
SİOÖ Toplam Puan	r	0.420**	-0.595**	-0.503**
	p	0.00*	0.00*	0.00*

r:Pearson Correlation *p<0.00 düzeyinde anlamlıdır **p<0.05 düzeyinde anlamlıdır

Tablo 2'de SİOÖ ile ÖKAÖ arasındaki korelasyonda SİOÖ Aşkınlık Alt Alanı – ÖKAÖ Yok Olma alt alanı ile pozitif yönlü düşük düzeyde anlamlı ilişki olduğu korelasyon kat sayısının 0.338 olduğu ($p<0.00$), SİOÖ Aşkınlık Alt Alanı – ÖKAÖ Ölüm Sonrası Hayat ve Motivasyon alt alanları arasında negatif yönlü orta düzeyde anlamlı ilişki olduğu korelasyon katsayılarının -0.609 ve-0.448 olduğu görülmektedir ($p<0.01$) (Tablo 2). SİOÖ Doğayla Uyum Alt Alanı – ÖKAÖ Yok Olma alt alanı ile pozitif yönlü düşük düzeyde anlamlı ilişki olduğu korelasyon kat sayısının 0.414 olduğu ($p<0.00$), SİOÖ Doğayla Uyum Alt Alanı – ÖKAÖ Ölüm Sonrası Hayat ve Motivasyon alt alanları arasında negatif yönlü orta düzeyde anlamlı ilişki olduğu korelasyon katsayılarının-0.517 ve-0.478 olduğu görülmektedir ($p<0.01$) (Tablo 2). SİOÖ Anomi – ÖKAÖ Yok Olma alt alanı ile arasında negatif yönlü orta düzeyde anlamlı ilişki olduğu korelasyon kat sayısının -0.347 olduğu ($p<0.00$), SİOÖ Anomi – ÖKAÖ Ölüm Sonrası Hayat ve Motivasyon alt alanları arasında pozitif yönlü düşük düzeyde anlamlı ilişki olduğu korelasyon katsayılarının 0.231 ve 0.324 olduğu görülmektedir ($p<0.01$) (Tablo 2). SİOÖ Toplam Puan – ÖKAÖ Yok Olma alt alanı ile pozitif yönlü orta düzeyde anlamlı ilişki olduğu korelasyon kat sayısının 0.420 olduğu ($p<0.00$), SİOÖ Doğayla Uyum Alt Alanı – ÖKAÖ Ölüm Sonrası Hayat ve Motivasyon alt alanları arasında negatif yönlü orta düzeyde anlamlı ilişki olduğu korelasyon katsayılarının -0.595 ve -0.503 olduğu görülmektedir ($p<0.01$) (Tablo 2).

5. TARTIŞMA (DISCUSSION)

Bu çalışmada hastaların spiritüel iyilik düzeyleri arttıkça, yaşama anlam veren ve geride kalan yakınlarına miras bırakmayı sağlayan bir durum olarak, algılama düzeylerinin yükseldiği belirlendi. Literatürde spiritüel boyutun, yaşamın, sağlığın, hastalığın ve ölümün anlamının bulunmasında bireylere yardımcı olduğu bildirilmektedir [8 ve 9]. Bu doğrultuda bireylerin spiritüel iyilik düzeylerindeki artışın ölüme yükledikleri anlamı da olumlu yönde etkileyebileceği düşünülmektedir.

6. SONUÇ VE ÖNERİLER (CONCLUSION AND RECOMMENDATIONS)

Sonuç olarak palyatif bakım, bireyi fiziksel, psikolojik, sosyal ve ekonomik yönden etkileyen çok boyutlu bir hastalıktır. Palyatif bakım hastalarının yaşadıkları fizyolojik ve ruhsal sorunlar ile baş edebilmeleri için, sahip oldukları spiritüel iyilik düzeyleri ile yararlandıkları başa çıkma yöntemlerinin belirlenmesi ve elde edilen bulgular doğrultusunda uygun stratejiler geliştirilmesi son derece önemlidir. Palyatif bakım hastalarına bakım sunarken, hastaların psikososyal sorunları ile birlikte ölüme yükledikleri anlamların belirlenmesinin ve uygun sağlık bakımının planlanmasının tedaviye uyumlarını artıracağı, sosyal çevreleriyle olan ilişkilerini geliştireceği ve iyileşme süreçlerini hızlandıracağı düşünülmektedir. Palyatif bakım hastalarının ailesi, arkadaşları ve değer verdiği kişilerin bakıma dahil edilmesi ve hastaların onlarla daha çok vakit geçirmelerine fırsat verilmesi, palyatif bakım hastalarına bakım ve tedavi sunan sağlık bakım profesyonellerine, hastaların spiritüel gereksinimlerinin karşılanması konusunda eğitimler düzenlenmesi, palyatif bakım hastalarının holistik yaklaşım doğrultusunda ele alınarak, spiritüel iyilik düzeylerinin belirlenmesi, palyatif bakım hastalarına ihtiyaç duymaları halinde psikolojik/manevi danışmanlık ve rehberlik hizmetlerinin sunulması önerilmektedir.

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CHANGING CONSUMER HABITS IN THE CONDITIONS OF A PANDEMIC IN THE REPUBLIC OF SERBIA

ABSTRACT

The pandemic has caused unprecedented changes in the lives of people around the world. The new habits of people in the way of life that have been created could be maintained even after the existing crisis, which indicates a permanent change in the habits of consumers in shopping and consumption. The focus of marketing research in such conditions becomes changes in priorities in purchasing and consumption, the dynamics of changes in established patterns and criteria of purchase and their persistence in the post-pandemic period. An important segment of marketing research in a pandemic is the changed habits in terms of the use of sources and ways of informing consumers about products and services and the use of online shopping channels. This information is crucial for market segmentation and identification of consumer categories with respect to demand value and purchasing methods. Based on the above facts, the focus of this paper is to investigate the immediate and long-term effects of the Covid-19 virus pandemic on consumer behavior. The intention is to identify changes in the lifestyle of consumers as a consequence of the current pandemic, but also its sustainability after the pandemic.

Keywords: Covid-19, Consumer Behavior, Consumer Habits, Online Shopping, Consumption

1. INTRODUCTION

The Covid-19 pandemic has led to a dramatic loss of human life around the world, and is a challenge for the entire world. Covid-19 and its consequences have led to concerns, fears and apprehension among individuals around the world. Due to the Covid-19 pandemic, all aspects of our lives have changed dramatically. A large number of consumers are facing disruptions when it comes to shopping channels, which was affected by the sudden appearance of Covid-19. Adherence to social distancing measures, which was subsequently rebranded as physical distancing, significantly influenced changes in consumer habits (Sorensen, et al., 2021:10). Thanks to information technology, catastrophic trade losses were avoided by switching to e-commerce. The true extent of e-commerce was determined during the duration of Covid, and its emergence accelerates the unfolding revolution in business. Covid-19 undoubtedly changed consumer habits, so many customers used e-commerce services for the first time, while others only reinforced this pattern of behavior. The key part of electronic commerce is internet commerce, which enables the purchase of products at any time of the day or night. Buying is possible both in the country and abroad, it is possible to compare the price and quality of the product, so it is considered the fastest and most efficient way of buying.

The needs and habits of consumers determine their consumption system. However, consumer habits and needs are dynamic categories that change under the influence of numerous factors. The most important

are: changes in consumer life, technological development, legal restrictions and natural disasters. The first group of factors is related to changes related to: age of the consumer, marital status, birth of children, change of job and place of residence, acquisition of new friends. Another factor is technology, which continuously changes people's lives, existing habits and creates new ones. The mass use of smartphones, the Internet and e-commerce have fundamentally changed the process of informing, communicating and purchasing consumers. Searching for information and ordering through online channels have become the dominant way of purchasing products/services for many consumers. The third factor that affects the change in consumer habits are legal restrictions related to the way and conditions of using certain products/services (regulations related to traffic, behavior in public and closed spaces, use of unhealthy products-alcohol, cigarettes). The fourth and less predictable factors refer to natural disasters such as: earthquakes, floods, hurricanes, global pandemics, including the current pandemic caused by the Covid-19 virus.

The current pandemic has caused unprecedented changes in people's lives all over the world. Restrictive measures regarding the movement of people and goods across national and international borders, changes in the way of doing work, education, shopping, etc., forced people all over the planet to adapt to new life circumstances [9 and 14]. Starting from the prohibition of movement outside the national borders of their countries, through the introduction of a state of emergency, limiting freedom of movement, and up to changes in daily habits such as eating habits, engaging in sports or physical activities, fulfilling business obligations, going to stores and other facilities. Repercussions are most visible in the behavior of consumers in shopping and consumption, ie. in the change of their needs, desires, information and purchasing methods. Based on the above facts, the focus of this paper is to investigate the immediate and long-term effects of the Covid-19 virus pandemic on consumer behavior. The intention is to identify changes in the consumer's lifestyle as a consequence of the current pandemic, but also its sustainability after the pandemic.

2. RESEARCH SIGNIFICANCE

An important segment of marketing research in a pandemic is the changed habits in terms of the use of sources and ways of informing consumers about products and services and the use of online shopping channels. This information is crucial for market segmentation and identification of consumer categories with respect to demand value and purchasing methods. Based on the above facts, the focus of this paper is to investigate the immediate and long-term effects of the Covid-19 virus pandemic on consumer behavior. The intention is to identify changes in the lifestyle of consumers as a consequence of the current pandemic, but also its sustainability after the pandemic.

3 THE IMPACT OF THE COVID-19 VIRUS PANDEMIC ON CONSUMER BEHAVIOR

The lives of people around the world have been significantly changed during the current pandemic. People live differently, work differently, buy differently and think differently. Apart from the negative consequences for people's physical and mental health, the Covid-19 virus pandemic has led to a huge drop in economic activities at the global level [12 and 19]. There was a change in the movement of people, goods and capital, losses in tourism, air traffic, catering [3, 4 and 8]. Consumers are more than concerned about the impact of

Covid-19, both from a health and economic perspective. The new habits of people in the way of life that have been created could be maintained even after the current crisis, which indicates a permanent change in consumer buying and consumption habits. Changes in purchasing and spending have changed throughout the pandemic. According to the Nielsen agency, these changes can be structured in six stages:

- Proactive shopping with an emphasis on health;
- Reactive health management;
- Creation of stocks;
- Preparation for life in quarantine;
- Limited life;
- Life in the "new normal".

Proactive shopping with an emphasis on health is characteristic of the beginning of the pandemic when consumers were focused on buying groceries, hygiene products, supplements and medicines. In the second phase, consumers were directed to purchase products that will help them prevent contracting the virus and spreading the virus to other people. Such products were: protective face masks, gloves, disinfectants for hands and space. Bearing in mind these two phases, it can be concluded that in addition to basic needs, consumers tried to satisfy new needs that were not given much importance until the beginning of the pandemic. The third phase refers to the creation of stocks, that is, focusing consumers on buying large quantities of products. Life in quarantine resulted in less frequent trips to the so-called larger purchases and inventory creation. The fifth phase, the so-called limited life, is best described through the growth of "on-line" shopping, while the sixth phase implies the acceptance of adopted habits and new consumer needs as a "normal" state.

Looking at the way of living and working in the new circumstances, Sheth (2020) identified eight immediate effects of the Covid-19 pandemic on consumption and overall consumer behavior: product hoarding (stockpiling), improvisation, delaying purchases, embracing digital technology, blurring the lines between business and private life, shopping from home, talent discovery and virtual gatherings with friends and family [21].

Figure 1. Impact of the Covid-19 pandemic on consumer shopping behavior [21]

Accumulation of products, ie stockpiling of everyday consumption products is a common reaction of consumers in situations of uncertainty regarding the supply in the near future. This kind of consumer behavior has led to temporary shortages of some products in

certain countries (toilet paper, bread, bottled water, meat, disinfection and cleaning products, medicines). Improvisation of real situations becomes a normal consumer behavior in situations where there are certain limitations physical, economic, legal. In the process of improvisation, existing habits are gradually lost and new ones are created, new ways of consuming and buying products/services are adopted. In such situations, virtual visits to churches, liturgies, museums, concerts, and schools become a necessary reality.

In times of crisis and uncertainty, the general tendency is to postpone the purchase and consumption of non-existential products or services, which are purchased from discretionary income. It is primarily about the purchase of durable consumer goods such as: cars, real estate, technical products, clothes and shoes, the purchase of services such as: cosmetic and hairdressing services, concerts, sports, restaurants, cafes, entertainment. In the pandemic situation, consumers adopted new technologies and their application more intensively. An obvious example is product delivery services, the use of Zoom and other communication platforms that were used for private purposes at the beginning of the pandemic, and later for remote teaching, meetings, forums, conferences. Also, the so-called telehealth for conducting virtual visits to doctors. The use of digital technology in the pandemic is becoming a part of people's daily lives, including the purchase and consumption of products/services. Shopping from home has become an inevitability due to the complete and limited lockdown. Over time, consumers realize that this way of shopping is more convenient and simpler, and that it provides the opportunity to receive personalized value.

With the introduction of restrictive measures in the movement of people and time and space limitations, the boundaries between private and business life become unclear, which led to changes in lifestyle and leisure time. One of the key issues during the pandemic is how to get in touch with distant friends and family. Communication technologies, especially social networks, have contributed to partially overcoming this problem. Given the restrictions on people's movement and the flexibility to use their free time while staying at home, people have been engaged in activities that were neglected before the pandemic. These can be activities of cooking and experimenting with recipes, focusing on training and playing sports, improving talent, virtual visits to museums, galleries. Content sharing goes viral, and many consumers become so-called. producers who want to make money that way. For example, the YouTube channel during the pandemic was full of videos that have the potential to create innovation and business success. The question is whether people's new habits will be maintained after the pandemic?

The fear of infection with Kovid-19 manifested itself differently in different countries:

- In Serbia, the online purchase of organic food has increased to 66.67%, compared to the period before the Covid-19 pandemic. Changes in percentage terms from the aspect of online shopping can be explained by the increased fear of infection with Kovid-19, as well as fears for one's own health. Organic food was consumed the most by women, generation X (aged 25-40), consumers who completed higher education and those with an above-average monthly income [5].
- In China during the Covid-19 pandemic, food was mostly bought online by young people living in big cities [6].
- In the USA, 78% of women do not feel safe when testing cosmetic products, and about 2/3 of respondents have a reserved attitude

when it comes to trying on clothes in changing rooms, or when consulting with sellers, which was not the case before the Covid-19 pandemic. Home delivery services have been used enormously by customers who do not want to leave their homes. After the curfew, 48% of respondents said they would avoid shopping in malls and 32% of respondents said they would avoid shopping in stores, so retailers were looking for solutions to find ways to interact with customers through online channels [20].

- In India, consumers have a specific attitude when making purchasing decisions. They need to see and touch the product before they decide to buy, especially if the value of the goods is higher [13 and 23].

Many customers are conservative and tend to make decisions based on promotions, eg when discounts are offered if you buy online, free shipping and the like. The Covid-19 pandemic affected the growth of the number of users of online shopping, for whom such a way of shopping was unimaginable [24].

4. CHANGES IN CONSUMER BEHAVIOR CAUSED BY THE PANDEMIC

Changes in consumer needs and habits during the Covid-19 pandemic have motivated marketing researchers to focus on identifying specific changes in priorities and purchasing patterns, as well as predicting consumer behavior after the pandemic. One such survey was carried out by the auditing and consulting company EY on a sample of 1000 respondents in the territory of the Republic of Serbia in 2021, on the basis of which it established the so-called "EY Index of Changing Consumer Habits". Research has shown that 57% of respondents believe that the fear of the Covid-19 virus will stop affecting their lives no later than two years after the declaration of the pandemic. Few respondents (2%) believe that the fear of the pandemic will disappear only in 3-5 years from the beginning of the pandemic. The said survey also included changes in respondents' consumption. As expected, staples are a shopping priority both before and after the pandemic. Table 1 shows the results of research on the consumption of certain categories of products before and after the pandemic. Based on the results, it can be concluded that all investigated product categories have a tendency to increase in household consumption in the Republic of Serbia. Based on this, it can be concluded that such trends will continue and that even after the pandemic, consumers will take more care of their health and personal hygiene, which will affect their purchases. The biggest changes were observed in the purchase of beauty and cosmetic products (change from 63% to 72%, before and after the pandemic respectively) and soft drinks (from 60% to 70%, before and after the pandemic respectively).

Table 1. Consumption in the Republic of Serbia before and after the pandemic [21]

Product Category/Consumption	Before Pandemic	After Pandemic
Items For Personal Hygiene	69%	73%
Fresh Food	68%	73%
Beauty and Cosmetics	63%	72%
Frozen Food	62%	67%
Non-Alcoholic Drink	60%	70%

Similar research was carried out by the GFK agency on the territory of the Republic of Serbia in 2021. The results showed that consumers in Serbia expect that after the pandemic the structure of consumption will be identical to that during the pandemic: fresh food

(73%), canned and dried food (64%), frozen food (67%), household products and household chemicals (72%), personal care items (74%), beauty and cosmetics (63%). Grocery delivery services (61%) and online streaming platform services (59%), according to respondents, will be the categories on which consumers in Serbia will spend less financial resources after the pandemic. On the other hand, according to respondents' responses, consumers in Serbia plan to continue with adopted habits in the future and increase their budgets for fresh food (29% of respondents), vacations (32%) and 30% for recreation outside the home. Such results agree with the results of the same research at the global level.

The survey by the GFK agency also included respondents' preference for online shopping. The research results showed that online shopping in Serbia recorded growth in the first two years of the pandemic, but lagged behind the growth in developed economies. The number of online customers is growing, but delivery problems have been identified that have consequently affected the frequency of purchases. This is supported by changes in the field of advertising. According to the research results, according to the RetailZoom tool for monitoring online advertised leaflets Promotrack, it is noted that during the year, about 2500 brands are advertised in this way in the Republic of Serbia. However, from the beginning of 2020 to November of the same year, the number of leaflets was lower by 19% compared to the same period in 2019. Guided by this knowledge, it can be concluded that more intensive promotion of the company on digital platforms is necessary, in order to better position itself on the digital market. Also, it is necessary to eliminate identified problems in online delivery if companies want to use them in the sale of their products/services.

Research on differences in consumer lifestyles before and during the Covid-19 virus pandemic in the Republic of Serbia (specifically the city of Kragujevac) in 2020 showed that there are significant differences in consumer habits when it comes to travel, the use of online shopping and payment channels and leading a healthy lifestyle, while the way of eating partially changed during the pandemic compared to the period before it was announced [11]. In this regard, research in Poland showed that staying at home during the pandemic increased the consumption of unhealthy food, i.e. more frequent consumption of meat, fast food, alcohol, even overeating (Sidor & Rzymski, 2020), which is in accordance with research by Ashby (2020) [1]. Authors Batlle-Bayer et al., with their research conducted in Spain looked at the differences in dieting before and during the pandemic and found that the era of the pandemic is characterized by more frequent consumption of products with higher energy and lower nutritional value. They conclude that after the pandemic, the way of eating will change in the opposite sense (returning to a healthier diet). On the other hand, Cheval et al., and Huang and Zhao identified in their research a greater intensity of leading a healthy lifestyle in the conditions of the Covid-19 virus pandemic [4, 10 and 22].

In addition to the change in consumer buying and consumption habits, it is indisputable that the criteria for purchasing products in pandemic conditions have also changed compared to the time before. Based on the conducted research, the respondents agree that for each product category that was the subject of the research (fresh food, packaged food, alcoholic beverages, non-alcoholic beverages, household chemicals, clothing and footwear, beauty and cosmetics) the price is the key factor on the basis of which they bring the final purchase decision. For all researched product categories, the percentage of respondents who agreed that price is the key criterion in the choice

is 62-83%. In second place is health (what is healthy for me), especially for fresh and packaged foods. What usually ranks fourth/fifth when it comes to product selection criteria is availability and/or service quality (30-44% of respondents agree with that).

The pandemic that has affected the whole world has, of course, a long-term impact. The survey also included questions related to expectations for future life after the end of the pandemic. Table 2 shows certain long-term changes as a result of the Covid-19 pandemic in Serbia and globally.

Table 2. Long-term changes as a result of the Covid-19 pandemic [15]

Items	Republic of Serbia	Global
The way I hang out	42%	41%
The way I approach medical care	30%	39%
The way I shop	30%	37%
Ways of traveling on holidays	30%	36%
The way I use my own transport	30%	35%

Based on the above data, we can conclude that there are no drastic changes in the comparison of Serbia with the world in the performance of daily activities. The biggest long-term changes are expected in the way of socializing in the Republic of Serbia 41%, while in the world 41%. Specifically, in the Republic of Serbia, the most pessimistic are the youngest (18-29 years old), among whom 71% believe that it will be worse than before the pandemic. At the same time, the long-term implications of the pandemic on the performance of daily activities, ways of doing business, traveling, using some services, dining out, etc., are also important. Namely, research by the EY company (2021) shows that the majority of respondents agree that in the future they will focus more on the hygiene of their home (66%), that they will use advanced technologies more intensively (74%), as well as online banking services (68%) and improve the way they buy or prepare food (42%).

The state of emergency led to the development of delivery services for food, beverages, supplements and other necessary products. Many of these delivery services started operating in 2019, but they have seen significant growth during the period of complete closure. A smaller number of respondents from the Republic of Serbia (4 out of 10 respondents) used product delivery services before the pandemic, but they noticed an increase in the number of their orders during the pandemic, while 20% of customers started using these services during the state of emergency (Smart Plus, 2021). These services served to bridge the limitation of the working hours of sales facilities and the movement of people, and when it comes to food, the restaurant experience, or at least part of the atmosphere, is transferred. Research conducted by the Smart Plus agency, which is available on the InStore portal, shows that almost every tenth resident of Serbia, ie 8%, bought groceries through online channels in 2021. Most of them are the youngest customers, between 18-29 years old, in Belgrade and Vojvodina. At the same time, no differences were observed in online shopping preferences between female and male respondents [16 and 17].

5. CONCLUSION

The pandemic of the Covid-19 virus has raised new questions in researching the needs and habits of consumers and the current lifestyle. The goal of such research is a better understanding of consumer behavior and their segmentation into appropriate market

segments and the creation of customized value. Familiarity of consumers with digital communication channels and online shopping is an important segment of such research and a criterion for consumer segmentation because their use becomes imperative in the new situation. Based on the presented research results, it is to be expected that such a trend will continue in the future [14]. In looking at the further trend of their use, it is necessary to bear in mind that the growth of digital communication during the pandemic is caused by physical distancing, on the one hand, but that people quickly adopt new ways of communication and shopping and can keep them in the long term, on the other hand [7].

At the same time, the long-term implications of the pandemic on the performance of daily activities, ways of doing business, traveling, using some services, dining out, etc., are also important. Namely, research by the EY company (2021) shows that the majority of respondents agree that in the future they will focus more on the hygiene of their home (66%), that they will use advanced technologies more intensively (74%), as well as online banking services (68%) and improve the way they buy or prepare food (42%). On the other hand, 65% of respondents from the Republic of Serbia indicated that they would permanently change the way they hang out/socialize, but in a negative context. What is worrying is the fact that this attitude is expressed among younger respondents (18-29 years old), among whom 71% of them believe that they will reduce the intensity of socializing compared to the period before the pandemic. There is the same percentage of respondents with a higher degree of education who agree with this point of view. When it comes to socialization, 80% of respondents who are in management positions also agree that in the future there will be less real socializing.

The results of the research presented in the paper indicate the need for companies to continue researching consumer buying and consumption habits, in order to establish the dynamics and intensity of changes. Such information is necessary in the strategic turn of the company, market segmentation and focusing on certain market segments in terms of the required value. This especially applies to the activities that were most at risk during the pandemic (travel agencies, hotels, banks, traffic, manifestations and events, restaurants, fast food, gyms).

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INVESTMENT FUNDS: CHALLENGES FOR ESTABLISHMENT IN THE FINANCIAL SYSTEM OF THE REPUBLIC OF NORTH MACEDONIA

ABSTRACT

The investment fund represents the concentration of monetary funds created with the sole purpose of gathering investors' capital, and investing that capital collectively through a portfolio of financial instruments such as stocks, bonds and other securities. What is more important, each investor retains ownership and control of his own shares. The European Commission recently considers that investment funds play a crucial role in facilitating the accumulation of personal savings, whether for major investments or for retirement. They are also important because they make institutional and personal savings available as loans to companies and projects which contribute to growth and jobs. Organizing in investment fund form offers significant advantages, ranging from a wider selection of investment opportunities, greater management expertise and lower investment fees than investors may be able to obtain on their own. In order to benefit from greater returns, it is recommended that investments in such funds be made mainly by avoiding short periods, respectively a period of at least five years is recommended. In the Republic of North Macedonia investment funds are still a relatively small segment of the total financial system and do not represent a significant threat to financial stability. The fact that investment funds with a special law were rationed relatively late, in 2009, also contributes to this situation. The feature of the practice of funds in the local system is that most funds' assets are invested in deposits in domestic banks and (mostly domestic) debt securities, which as instruments with fixed income usually carry lower risks, but also lower rates of return, on average. The main purpose of this paper is to provide a concise overview of the participation of investment funds in the Macedonian financial system. Through the processing of data provided by the National Bank, the Macedonian Stock Exchange and the Securities Commission, the author provides an argumentative overview of the presence and low activity of investment funds in the local financial system.

Keywords: Investment Fund, Savings, Financial System, Republic of North Macedonia

1. INTRODUCTION

Investors face a dizzying array of dilemmas and alternatives as to where to put their money from traditional investments, such as stocks and other alternative investments. Today, the investment of united investors in the organization known as an investment fund is increasingly imposed. These funds pool the monetary resources of more people by investing them on behalf of their investors according to the particular investment strategy. Each investor within the fund owns shares that represent a portion of their ownership of the fund [1]. An investment fund is a supply of capital belonging to numerous investors used to collectively purchase securities while each investor retains

ownership and control of his own shares. An investment fund provides a broader selection of investment opportunities, greater management expertise, and lower investment fees than investors might be able to obtain on their own. Types of investment funds include mutual funds, exchange-traded funds, money market funds, and hedge funds [1].

The investment fund is a way to invest money alongside other investors, in order to benefit from the inherent advantages of working as part of a group. These advantages include the ability to [2]:

- Employment of professional investment managers;
- Taking advantage of lower transaction costs;
- Increasing capital diversification to reduce unsystematic risks.

With investment funds, individual investors do not make decisions about how a fund's assets should be invested. They simply choose a fund based on its goals, risk, fees and other factors. A fund manager oversees the fund and decides which securities it should hold, in what quantities and when the securities should be bought and sold. An investment fund can be broad-based, such as an index fund that tracks the S&P 500, or it can be tightly focused, such as an ETF that invests only in small technology stocks [1].

Investment funds, also known as collective investment vehicles, are financial structures for collecting and managing the money of many investors. Investors cede significant control over their money to professional managers, who buy securities in specific companies. As a result, all parties are winners. Investors can buy securities from companies that they could not otherwise hold due to transaction costs, legal restrictions or lack of expertise. They can diversify assets, achieve better liquidity and receive the benefits of professional management and research. Enterprises in need of capital also benefit from the funds. Once they have grown beyond the stage of financing themselves from family, friends and other informal sources, enterprises need external debt and equity financing to grow and invest [3].

Investment funds are promoted with a broad list of investment objectives, based on specific geographic regions (e.g. emerging markets) or specified industry sectors (e.g. technology). Funds are often selected based on these specified investment goals, their past performance, and other factors such as fees. The establishment and work of investment funds, as well as companies for the administration of investment funds, the issue and sale of parts and shares, the purchase of parts, the promotion of investment funds, the work performed by third parties for the investment funds and the work of the custodian bank, are regulated by the Law on Investment Funds, while the provisions of the Law on Securities, the Law on Companies, the Law on Bankruptcy and the Law on General Administrative Procedure are appropriately applied to matters not regulated by this Law [4].

Measures to facilitate cross-border distribution of funds are contained in Directive and Regulation that complement and amend an existing EU legislation on collective investment funds. It is expected to increase transparency and create a single access to information on national rules related to marketing requirements and regulatory fees and charges levied by national competent authorities. The package allows for simpler exit of the host market (de-notification), and permits management companies to choose more flexible and cheaper ways of communication and provision of administrative services to investors in other Member States and create conditions for promotion of AIFs and investment strategies and seek for new investors before using the passport for marketing [5].

2. RESEARCH SIGNIFICANCE

The main purpose of this paper is to provide a concise overview of the participation of investment funds in the Macedonian financial system. Through the processing of data provided by the National Bank, the Macedonian Stock Exchange and the Securities Commission, the author provides an argumentative overview of the presence and low activity of investment funds in the local financial system.

3. FOUNDATION

The investment fund is established by the pooling of monetary funds intended for investment by natural and legal persons of the country, through public call or private offer, with which the company for administration, respectively, the company for the administration of equity-end funds, administers on behalf of the investors, with the principle of risk diversification is applied. The investment fund can be established as an open-ended, closed-ended or equity-end fund. The open and closed fund is established and administered by the company for administration, while the equity-end fund is established and administered by the company for the administration of equity-end funds [5]. The funds are registered in the register of investment funds, which is maintained by the Securities Commission [5]. The request for registration is submitted by the company for administration together with the request for granting the investment fund's work permit. The commission decides on the registration of the investment fund and at the same time grants permission for the fund's work. Upon granting the work permit and registration of the investment fund, the commission assigns an identification number to each fund [5].

4. TYPES

The Law on Investment Funds provides for three types of funds: open-end, closed-end and equity-end fund.

4.1. Open-end Fund

The open-end fund represents the special property, without the status of a legal entity, the owners of the parts have a proportional right to the profit of the fund and at any time they have the right to demand the payment of the part, in which case they will leave the fund. The purchase of shares is made exclusively with the payment of monetary funds, with which the buyer of the shares creates a contractual relationship with the company for administration, which is obliged to administer with the paid monetary funds as with the share of the common property in accordance with the conditions noted in the prospectus. The signature of the open-ended fund must contain the words 'open-ended fund' or the abbreviation 'OEF' [5]. The majority of investment fund assets belong to open-end mutual funds. These funds issue new shares as investors add money to the pool, and retire shares as investors redeem. These funds are typically priced just once at the end of the trading day [6].

4.2. Closed-end Fund

A closed-end fund is a joint-stock company that is established for the collection of funds through the public offering of shares and the investment of those funds, in which case the principle of risk diversification is applied [6]. The basic capital of the fund is not it can be less than 300000 euros in denar equivalent, from the day when the monetary means are completely collected [6]. Closed-end funds trade more similarly to stocks than open-end funds. Closed-end funds are managed investment funds that issue a fixed number of shares, and trade on an exchange. While a net asset value (NAV) for the fund is

calculated, the fund trades based on investor supply and demand. Therefore, a closed-end fund may trade at a premium or a discount to its NAV [6].

4.3. Equity-end Fund

The equity-end fund represents the special property, without the status of a legal entity, formed for the purpose of collecting monetary funds through a private offer for the sale of documents for shares in the fund, the funds of which are invested in accordance with the investment goals provided for in the prospectus of equity-end fund. Owners of the documents have the right to share, in addition to the right to share in the profit in the equity-end fund, to request and pay the share and thus leave the fund, in the manner and under the conditions provided in the prospectus of the fund. The equity-end fund is also registered in the register of funds [6]. The equity-end fund is established only for the specified time which cannot be shorter than eight years. The amount of the equity-end fund reaches at least 500000 euros in denar equivalent. Fund size means the maximum registered payment obligation of all investors according to all bases throughout the duration of the fund. In this case, the minimum contractual obligation received for the investment of each individual investor in the equity-end fund cannot be lower than 50,000 euros in denar equivalent, which the investor is obliged to fulfill according to the call of the equity-end fund management company in accordance with the provisions of the prospectus. Moreover, the maximum number of investors in the equity-end fund is 20 investors [6].

5. INVESTMENT FUNDS IN THE PRACTICE OF THE REPUBLIC OF NORTH MACEDONIA

These financial institutions in the Republic of North Macedonia are exempted from the obligation to submit regular reports to the Securities Commission. In addition, control and supervision of their work by the Securities Commission is not foreseen for these financial institutions. Investments of individual types of domestic investors in investment funds (primarily, non-financial legal and natural persons) are quite small compared to the total assets at their disposal on an aggregated basis. Hence, possible problems in the operation of investment funds (illiquidity of funds, high downward correction of property value, etc.) would not have significant transferable negative effects on domestic entities (on an aggregated basis), which are investors in these funds. As a result, in the last five years, investment funds have continuously increased their share in the total assets of the open-end investment funds. The significance of investment funds for the Macedonian financial system in 2016 was modest. Despite the upward trend of their share in total assets of the financial system, it was small and equaled barely 0.7%. Investment funds reported positive yield (weighted rate of return) throughout the year, particularly debt and equity (share) funds. The index of the movement of prices of unit documents in open-end investment funds increased during 2016 [7].

In percentage

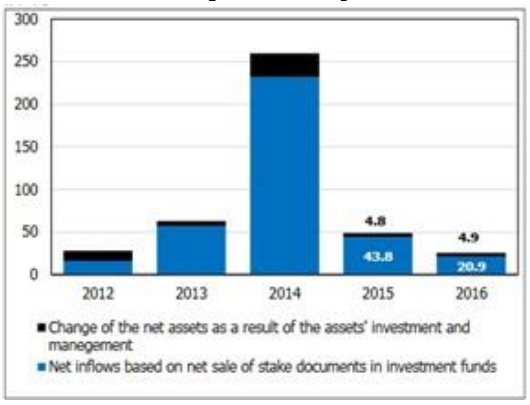

Chart 1. Growth structure of net assets of investment funds
(Calculations of the National Bank based on data from the Securities Commission)

The largest trade in investment funds' units was further registered in documents owned by domestic entities, despite their decrease in 2016. The reduced trade in unit document in the investment funds decreased the net inflows from transactions with unit documents by 29.2% compared to the previous year. The net inflows from sale of unit documents in 2016 arise almost equally from the domestic natural persons, domestic non-financial legal entities, domestic banks and other domestic financial institutions [7].

In million of denars

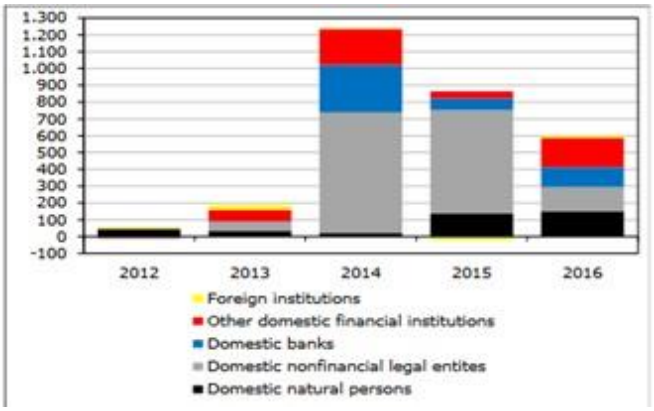

Chart 2. Structure of net inflows based on share document transactions
(Calculations of the National Bank based on data from the Securities Commission)

In 2017, investment funds still had very little importance within the Macedonian financial system. Despite the upward trend of their share in total assets of the financial system, it was small and equaled barely 1.0%. The net inflows from the sale of unit documents in 2017 contributed to increasing the open-end investment funds' assets. Investment funds reported positive yield (weighted rate of return) throughout the year, particularly equity (share) funds. The index of the movement of prices of unit documents in open-end investment funds increased during 2017 [8].

In percentage

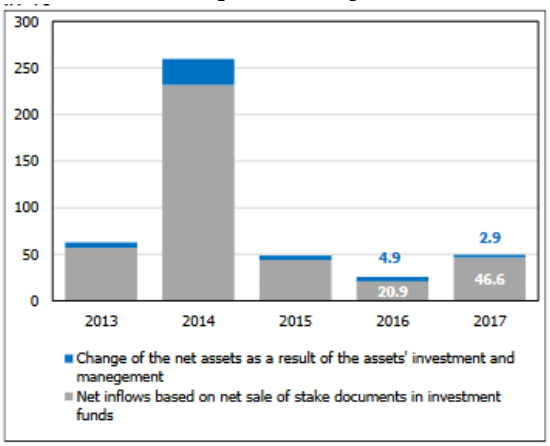

Chart 3. Growth structure of net assets of investment funds (Calculations of the National Bank based on data from the Securities Commission)

The turnover of investment funds' units registered a more significant growth. The largest contribution to increased trading in investment funds unit documents was that of the domestic entities, primarily banks and non-financial legal entities, which had high participation in both purchasing and selling of unit documents. The increased interest in trading in documents for stakes from the open-end investment funds is due to more factors, and one of the most significant ones is the downward trend in the interest rates in the banking sector and the gradual familiarization of the households and the corporate sector with the opportunities for investing in the funds as one of the alternatives to generate higher yields [8].

In million of denars

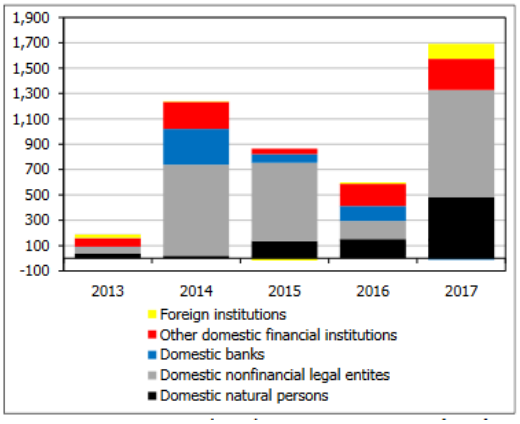

Chart 4. Structure of net inflows based on share document transactions (Calculations of the National Bank based on data from the Securities Commission)

In 2018, their growth has been solid, although it slowed down, largely due to reduced net inflows based on the sale of documents for stake in investment funds, as well as the loss arising from management and investment of the funds' assets. Most of the investment funds' assets are invested in deposits in domestic banks and debt securities, which as instruments with fixed, predetermined payment dynamics and income levels, usually carry lower risks, as well as lower rates of return. However, in the last five years, amid falling interest rates,

some investors have decided to take bigger risk, investing more their assets in investment funds, whose assets mostly include placements in equity instruments [9].

In percentage

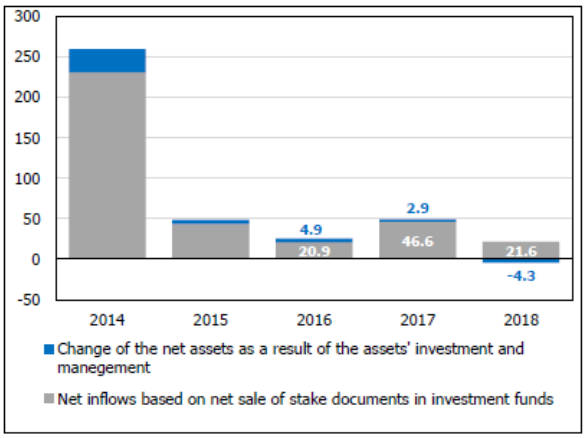

Chart 5. Growth structure of net assets of investment funds (Calculations of the National Bank based on data from the Securities Commission)

Almost all the net assets of the investment funds (or 97%) are owned by domestic entities, of which 40.3% are owned by non-financial legal entities, while natural persons and non-bank financial institutions account for 29.9% and 23.6%, respectively. The smallest part of the net assets is owned by banks (5.4%), the government and public sector entities (0.8%). In 2018, domestic natural persons accounted for the largest stake trading, of which the investment funds made net inflows of denar 606 million (representing 52% of the total net inflows), as well as the domestic non-bank financial institutions from which the funds realized net inflows of assets of denar 557 million (i.e. 47.8% of total net inflows). In contrast, investment funds registered net outflows of domestic non-financial legal entities on the basis of paid stakes in the amount of denar 191 million (unlike the significant growth in 2017267), which contributed to the decelerated growth rate of the investment funds' assets in 2018) [9].

In million of denars

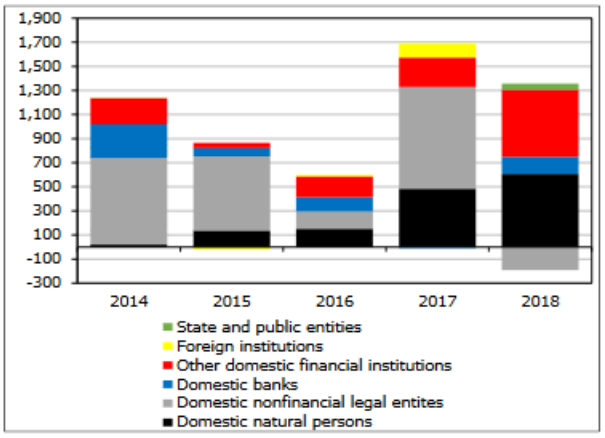

Chart 6. Structure of net inflows based on share document transactions (Calculations of the National Bank based on data from the Securities Commission)

In 2019, the growth of investment funds was doubled, due to high net incomes of assets based on sales of documents for stakes, as well as the high return realized from investing and managing these assets, amid extremely favorable developments on financial markets in 2019. The investment funds increased their investment not only in equity instruments issued by domestic market, but as well as in foreign equity instruments, exposing themselves to the risk of changing trends on world market of equity shares, which was materialized in the beginning of 2020, amid global coronavirus pandemic. Namely, with the announcement of the COVID-19 pandemic in the middle of March 2020, the investment funds' annual rates of return reached significant negative values, which in April 2020, gradually started to leave the negative zone, with the imminent calming of the financial markets' condition [10].

In percentage

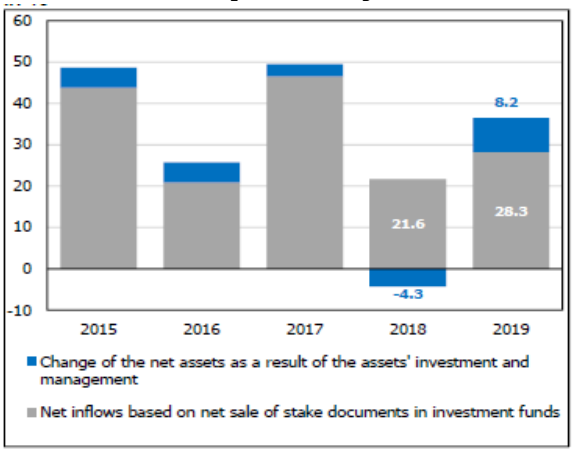

Chart 7. Growth structure of net assets of investment funds
(Calculations of the National Bank based on data from the Securities Commission)

The largest share (68.9%) of the investments of the open-end investment funds are in Macedonian denars. The dominant share of the domestic currency corresponds to the prevailing share of the investments issued by the domestic issuers. Next in importance are investments in euro denominated instruments, which account for about 20% of the total assets of the investment funds. Hence, the strategy of maintaining a stable nominal exchange rate of the denar against the euro is important for maintaining the value of the invested funds in the open-end investment funds [10].

In percentage

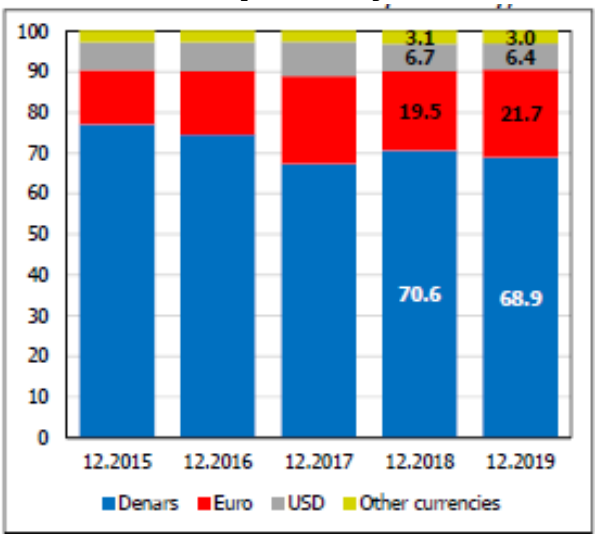

Chart 8. Structure of the fund's assets by currency
(Calculations of the National Bank based on data from the Securities Commission)

Amidst the global pandemic of the new corona virus and, subsequently, increased uncertainty and uncertainty, investment fund rates of return have seen increased volatility and, in general, a strong downward trend in 2020. Equity funds were particularly affected, which ended 2020 with negative annual rates of return [11]. The growth trend of the share of placements in equity instruments in the total assets of investment funds continued in 2020, due to the increase in investments in foreign equity instruments, which increases the exposure of investment funds to the risk of changing movements in the world markets of equity securities from value.

In percentage

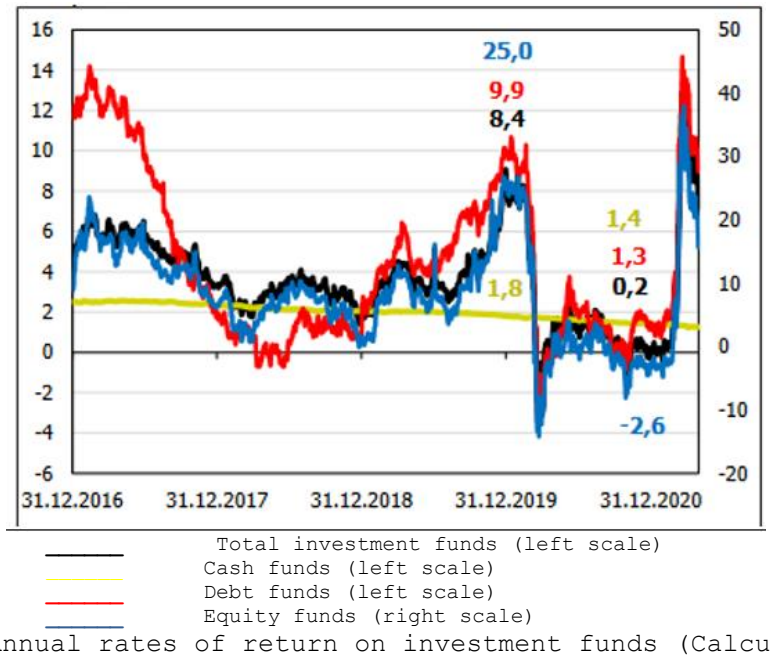

Chart 9. Annual rates of return on investment funds (Calculations of the National Bank based on data from the Macedonian Stock Exchange)

The largest part of the net assets of investment funds (99.8%) is owned by domestic entities, mostly natural persons, followed by non-financial legal entities and non-banking financial institutions. In 2020, on a net basis, only domestic individuals and non-banking financial institutions invested funds in investment funds and fully conditioned the net inflows of funds in these funds. The other types of entities achieved net sales of share documents in 2020, in which domestic non-financial legal entities had the highest share (91%).

In million of denars

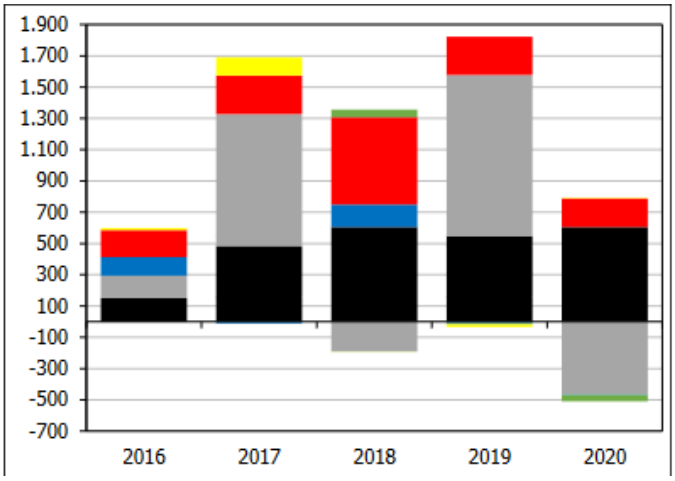

Chart 10. Structure of net inflows based on share document transactions (Calculations of the National Bank based on data from the Securities Commission)

6. CONCLUSION

Investment funds today are considered one of the most popular strategies for obtaining returns. They are financial vehicles that pool money contributed by a group of individuals to invest in derivatives, fixed-income securities, shares and other financial instruments. In the Republic of North Macedonia, although from a legal point of view, the institution of the investment fund is fully regulated by a special law, the People's Bank as competent, only from 2016 has started to publish data on the financial flow of this entity. The research presented above offers some conclusions regarding the case of North Macedonia:

- The investment funds are one of the fastest growing financial institutions, but still represent a very small segment of the local financial system;
- Most of their assets has been placed in instruments issued by domestic issuers and traded on the domestic market;
- The largest share of the investments of the investment funds are denominated in Macedonian denars, followed by the euro currency;
- Developments in the domestic economy and the performances and activities of domestic financial instrument issuers (above all, banks and the government) are of the utmost importance for the performance and risk exposure of investment funds.

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THE IMPORTANCE OF THE CLUSTER MODEL AND POLICY HISTORY IN ECONOMIC DEVELOPMENT: THE COUNTRIES OF GERMANY AND TÜRKİYE

ABSTRACT

In our modern world, clusters are becoming increasingly relevant as a policy tool to increase economic development and competitiveness, and contribute to the development of innovation, new companies, new enterprises, and integrate them with the activities of entrepreneurs, local government, and universities, research and development. Centers contribute to the dynamic growth of the local economy. The study examines a variety of books, journals, and publications to gather theoretical information on the topic and classifies this information according to the purpose of the study, as well as analyzing and synthesizing experiences and policies in the sample countries and using a comparative method, The results of the German analysis, in particular, the study of the rules of application of the successful German food cluster strategy on the basis of Azerbaijan. The obtained results have the potential to form a cluster, applying not only in the food sector, but also in other sectors.

Keywords: Innovation, Diamond Model, Value Chain, International Competition

1. INTRODUCTION

Integration of markets lowers transaction costs for companies to locate in favorable business environments. In these business environments, companies can more easily take advantage of not only traditional factors such as resource support and geographic location, but also the presence of universities and research institutions, and qualified innovation and knowledge diffusion. Therefore, companies start to support clusters to make their economic strengths, advantages and distinctive features visible and to find advantageous business environments. A cluster is an economic union in which many enterprises compete and cooperate to obtain different economic advantages at the same time. We can see world-renowned clusters such as Hollywood in the film industry, Wine industry in California, Silicon Valley information technology as examples.

Cluster was popularized as a concept by Michael Porter. Michael Porter developed the concept of a cluster from his 1990 study "Competitive Advantage of Nations". Clusters are a natural manifestation of knowledge, skills, infrastructure and supporting industries that specialize in increasing productivity as the key determinant of maintaining high levels of well-being in a location [22].

Clusters are geographical concentrations of interconnected companies, specialist suppliers, service providers, companies in related industries, and associated organizations (e.g. universities, research centers, trade associations) in a particular field that compete with each other but also cooperate. The geographic scope of clusters extends from a region, a state, or even a single city to nearby or neighboring countries (South Germany and German-speaking Switzerland) [11].

In his theoretical work in 1920, Marshall showed that clustering provided benefits to companies by reducing the costs of transporting goods, people and ideas. The existence of clusters indicates that firms benefit from spatial proximity and competitive advantage. Clusters include industries that are important to competition and operating in conjunction, firms in related industries, financial institutions, specialist infrastructure providers, training institutions. Even organizations that affect the performance of a cluster, such as trade associations and trade associations, can be considered members of the cluster [33]. If foreign firms make permanent investments in a significant local asset, then they may be part of clusters. In other words, clusters represent the entire value chain of a broadly defined industry, from suppliers to end products, including supporting services and specialized infrastructure.

The definition of clusters is based on three basic pillars. The first column is geography. Clusters are usually concentrated in a region within a larger country and sometimes in a city. The second pillar is value creation. Clusters include companies in interrelated industries in the production of goods and services that customers value. The third column is the business environment. Clusters are affected by the specific business environment conditions that result from the cooperation of individual activities in the national innovation system, such as companies, government agencies, universities.

There are a number of reasons why firms that combine in clusters are more productive [25]:

First, being close to suppliers or customers reduces shipping costs while also increasing competition. And so, under competitive pressures, companies are encouraged to reduce recession, cut costs, stay competitive and make production more efficient. Second, clusters facilitate better matching of workers to jobs. Workers who are better suited to their jobs will be more productive. Third, firms in clusters are more likely to experience technology or knowledge spillovers that directly affect firm productivity. In all three of these reasons, firms become more productive by participating in clusters [1].

Clusters represent a new way of thinking about national, state and local economies and require and offer new roles for companies, governments and other institutions in increasing competitiveness. For companies, clusters present highly competitive business units. The health of the cluster is crucial to the health of the company. In addition, I would say, clusters ensure that companies can actually benefit from having more local competitors. For governments, competitiveness focuses on the overall economy. As clusters also propose new roles for governments, it is a priority for governments to remove obstacles to the growth and uplift of existing or emerging clusters [3]. Because clusters have a very important and driving force in increasing exports and even attracting foreign investments to the country. Clusters also argue that new and crucial relationships can occur between companies, government agencies and institutions such as schools, universities and public services.

Clusters occur in both developed and emerging economies, but clusters in advanced economies tend to be much more developed [9]. The appropriate definition of a cluster may differ in different places, depending on the segments in which member companies compete and the strategies they use.

We can define the main features of clusters as follows:

- One of the key features of clusters is that it reduces transaction costs. Clusters include companies from different fields that share similar raw materials, services, social

capital and knowledge. And this serves all cluster members in response to demand, suppliers, institutions and infrastructure in the cluster. The high availability of these inputs reduces the business transaction costs of existing companies and makes their operations more efficient.

- Clusters also have a significant impact on creating social capital. Social capital strengthens relationships and connections among cluster members and provides a level of trust between them for the flow of information, the identification of long-term partners and the willingness to act cooperatively. Social capital helps clusters to develop further.
- Clusters, capable of responding to a changing reality, are an economic structure that supports change, innovation and the continuous effort towards the highest level of quality, and this structure contributes to the acceleration of innovation. Therefore, a company that is a member of the cluster has a better chance of adapting to the changing reality, and at the same time, good and available information increases the opportunities to develop innovative products and services in the cluster.
- Clusters have the feature of creating the basis for parties to cooperate with each other. The companies in the cluster compete with each other in the free market and also cooperate on matters concerning the promotion of the cluster [4].

2. RESEARCH SIGNIFICANCE

The study examines a variety of books, journals, and publications to gather theoretical information on the topic and classifies this information according to the purpose of the study, as well as analyzing and synthesizing experiences and policies in the sample countries and using a comparative method, The results of the German analysis, in particular, the study of the rules of application of the successful German food cluster strategy on the basis of Azerbaijan. The obtained results have the potential to form a cluster, applying not only in the food sector, but also in other sectors.

3. MATERIALS AND METHODS

3.1. Methods and Techniques of The Clustering Strategy Implemented in Germany, Its Importance for The German Economy

German cluster initiatives and networks are a supporting pillar for the competitiveness of the national economy. Today, Germany's cluster initiatives and networks are among the strongest players in international comparison. German cluster initiatives and networks pave the way for innovation and reflect the high level of German expertise in numerous technology and business areas. A number of cluster policies and associated projects have been initiated at the national and federal state level since the mid-1990s to support business activities, and these cluster policies and related programs and projects have generally been implemented at three levels at national, federal and European level [8].

3.1.1. National Level

The “go-cluster” program - the Federal Ministry of Economic Affairs and Energy and the Federal Ministry of Education and Research support the development of efficient clusters on a national scale. The Federal Ministry of Economic Affairs and Energy has launched the "go-cluster" program, an excellent cluster program that unites the most

efficient national cluster management organizations. The "Go-cluster" program supports cluster management organizations with the development of innovation [6]. The clusters included in this program are pioneers of innovation and demonstrate how proficient they are in Germany's different industries and technological sectors. "Go-cluster" membership, quality and efficiency certificate for cluster management in accordance with European quality standards for innovation clusters and cluster supporting business partners; The right to use the "go-cluster: The perfect network" logo as a quality label; Participation in government economic initiatives and higher visibility; networking activities with the most productive innovation clusters from Germany and Europe; Participation in seminars on current issues of clusters and management; Individual consultancy of cluster managements on strategy development issues; It offers the right to apply for funding and other benefits [15].

Leading Cluster Contest (Top Cluster Contest) "More Innovations" run by the Federal Ministry of Education and Research. Greater Growth Pioneering Clusters Competition" aims to bring together the winners of this competition and the most important partners in innovation. The financing provided supports the implementation of clustering and innovation strategies, helping them to be successful internationally in the long run [31].

3.1.2. Federal Level

Germany's 16 federal states have launched a number of measures to support the development of productive clusters. These measures take into account the individual strengths of regions, such as technology, business or innovation, and also provide financial support to individual clusters in areas ranging from innovation projects, education activities, and joint public relations initiatives across the federal state [29].

Chart 1. Federal states of Germany
(Source:https://www.clusterplattform.de/CLUSTER/Navigation/EN/FederalLevel/federal-level.html)

The successful clusters of the federal states of Germany in Chart 1, the methods and techniques applied to create these clusters, the strategies implemented for the development of these clusters, and

the innovation programs that made them successful will be analyzed for each state.

3.1.3. Schleswig-Holstein

The region's cluster policy brings together business, science and R&D, using the innovation potential across sectors and technologies to increase innovation and competitiveness. Thus, they create dynamic, sustainable economic growth and innovative developments along the entire value chain. These policies support cluster management in successful and future industries and are funded by ABKF and the region's financial resources.

Hamburg district. In Hamburg, the "Regional Innovation Strategy 2020" is being implemented, based on the "Hamburg Innovation Alliance", which focuses on Technology and Cluster support and is jointly run by Hamburg politicians, industry and science [35]. The aim of this strategy is to make the Hamburg region one of Europe's leading innovation regions by the end of 2020. As part of this strategy, Hamburg has been promoting innovation, growth and employment in future-oriented industries with an active clustering policy for many years, and this strategy includes Hamburg clusters in the fields of life sciences, logistics, aviation, media and IT, renewable energy, healthcare, creative industries and maritime economics. is based on. Hamburg's goal is to systematically develop cluster bridges and more successfully address the potential for innovation and value creation between clusters in the future [36].

Hamburg's economic performance and future prospects are stronger than other cities in Germany. Innovation plays a central role in this strategy, because only through new and high-quality products, services and systematic solutions is it possible to create sustainable economic growth and jobs. "Innovations Allianz Hamburg" constantly creates new connections between business, research and policy executives and strengthens already existing close connections [18 and 34]. At Innovation Allianz these groups work together to develop a regional innovation strategy for Hamburg, where clusters play a special role. In addition to clusters for the life sciences, logistics, aerospace, media and technology sectors, there are clusters in the state of Hamburg working to unlock growth and development potential in the fields of renewable energy, healthcare and creativity, and the maritime industries. Hamburg works closely with the neighboring northern German states [7].

"Cluster Bridges for Hamburg" The EU attaches great importance to the potential for cross-clustering and in late 2014 selected Hamburg as one of six model regions for its modern cluster policy. The other five regions are Lapland (Finland), Nord-Pas-de-Calais (France), Centro Region (Portugal), Western Region (Romania) and Stockholm (Sweden). European Commission experts, together with Hamburg cluster stakeholders, are developing a cluster concept for Hamburg. The aim is to better use the existing innovation potential and added value among the Hamburg clusters in the future. Appropriately for Hamburg, these areas are designated as "cluster bridges" [2].

The following additional measures have been initiated to promote innovation:

- ✓ In 2013, Hamburg YTB (IFB Hamburg) was established to serve as the central financial institution of Hamburg. The aim of YTB is to further strengthen Hamburg's business environment, attracting and supporting new companies as a central place for innovation and trade [5].
- ✓ YTB's "PROFI" innovation program finances industrial research and experimental development projects up to 500000 Euros per

project and aims to enable them to strengthen R&D networks between companies and between companies and research institutions.

- ✓ "Innovations starter Fonds Hamburg" is an investment fund that enables young and innovative companies to receive financing of up to one million euros. The aim of the fund is to provide promising, innovative companies with the support they urgently need in the early stages.
- ✓ The "InnoRampUp financing program" was launched in 2013 and start-ups and start-ups receive financing up to 150000 Euros per project.
- ✓ The "Common Learning Space for Hamburg Clusters" project, launched in 2016, aims to strengthen inter-cluster cooperation for Hamburg clusters and to create new potentials in the fields of learning and development [10].
- ✓ The "InnoFounder financing program" specifically targets initiatives in the media sector. It provides financing for innovative products and services that are more resistant to competition.
- ✓ The Innovation Point of Contact (IKS) institution provides Hamburg companies access to universities and science. For this purpose, YIN cooperates closely with other transfer institutions of Hamburg [12].

- **Cluster 1.** Hamburg Aviation-In 2001, the state of Hamburg launched the initiative "Hamburg is an aviation hub". This initiative has since grown into an internationally recognized institution known as the "Hamburg Aviation cluster". With more than a century of aviation tradition, the Hamburg Region has become one of the world's main centers for the aviation industry, with activities covering all aspects of aircraft construction, aircraft maintenance and airport operation. Three industry giants - Airbus, Lufthansa Technik and Hamburg Airport, plus more than 300 SMEs and various science and technology institutions contribute to the expertise of this cluster. The "Hamburg Aviation Training Centre", opened in 2011, offers training to qualified personnel. This training center represents cooperation between companies and universities in Germany. That's why it has been awarded by the EU for best practice. The "New Flying" strategy of the "Hamburg Aviation" cluster the main aim of this strategy is to make aviation more efficient, ecological, reliable and flexible. In collaborative research and development, stakeholders cover the entire life cycle of the aircraft, from construction to maintenance, repair and recycling. The strategy focuses on Hamburg's core areas of expertise as an aviation hub the development and construction of aircraft and aircraft systems; development and construction of cabins and cabin systems; optimization of aviation services; increasing the efficiency of air transport systems; covers aviation related information and communication technologies [21]. The "Center for Applied Aviation Research (ZAL)" is the focus of the cluster's research activities. At this innovative facility, Hamburg is one of the most advanced aviation research centers in the world, where businesses and institutions in the aviation industry conduct joint research on future oriented topics. The federal government recognized the Hamburg Aviation cluster as one of Germany's first excellent clusters, and in 2008 the cluster's excellent "New Flying" strategy won the Federal Ministry of Education and Research's first cross

industry cluster competition. In 2014, the Hamburg Aviation cluster was one of only 40 clusters in Europe awarded the gold label by the European Commission for excellent cluster management [20].

- **Cluster 2.** Health Sector Cluster (GWHH) established in 2009 by the state of Hamburg and the Hamburg Chamber of Commerce. The cluster aims to bring together the expertise of providers and stakeholders in the health sector. It supports the development of long-term cooperation structures and networks, promoting employment, innovation and high-quality healthcare in Hamburg. There are Hamburg-based companies in this sector employing around 162000 people. The highly structured and specialized network of treatment facilities and hospitals contributes significantly to a top-notch healthcare in the Hamburg Region. Hamburg's Health Cluster also benefits from a partnership with the Life Science Nord cluster. The healthcare industry cluster also earned the bronze label of the "go-cluster" initiative in 2015 for its excellent networking. In addition, it is supported by innovative projects funded by ABKF and ASF and by Hamburg's Ministries Ministry of Health and Consumer Protection, Hamburg Ministry of Labour, Social, Family Affairs and Integration, Ministry of Economy, Transport and Innovation. For example, the "EFRE project", ie "Smart assistance for the elderly in Hamburg's neighborhoods", in which the GWHH cluster, private companies and the University of Hamburg participated, was evaluated until 2017 [24]. The project demonstrates how services and technology can be cleverly combined to create a living environment and lifestyle suitable for seniors. Later, from 2016 until today, GWHH manages the "Active and healthy neighborhoods Uhlenhorst and Rübenkamp project", which focuses on health promotion. In addition, GWHH is a partner in the "Project to improve the success of education in care" launched in 2014 [14]. This key project in skilled labor training is funded by ASF and the Ministry of Health and Consumer Protection.

3.1.4. Mecklenburg-Western Pomerania region

The most important business and technology-oriented clusters and network structures of this region are mostly focused on automobile manufacturing, aviation, logistics, agriculture and food industry, renewable energy, information technology, life sciences, maritime industry. The most important of the main purposes of this state is to provide social development. Parent spending for childcare centers decreased by €50 per child from 2018. The savings of 600 euros per year significantly alleviate the financial burden on parents. The long-term goal is to provide free daycare facilities. This provides great relief, especially for families in the lower and middle income groups. As far as schools are concerned, the centers, 200 biotechnology companies, and the leading trade fair BioTechnica. In fact, the Hanover Medical School in the region is an internationally recognized center for stem most important task is to support the inclusion of students with special needs and the inclusion of students without disabilities, according to the €50 million programme [13].

Lower Saxony and Bremen region. This region is the second largest federal state in Germany in terms of area. The "Braunschweig-Wolfsburg Research Center" is Europe's most important research center specializing in traffic control systems and air safety, and employs more than 2000 highly qualified people. Together with Hamburg and Bremen, the federal state is one of the aviation regions in Europe that can offer competence spanning the entire value chain of aircraft

construction. About 27% of shipbuilders in Germany work in this region. This state is home to nearly 5000 scientists working in these fields, along with research, agricultural and environmental technology cells (Investing in SMEs in the Eastern Partnership 2018). The advancement of research and development is primarily driven by instruments such as research and innovation associations. These initiatives generally receive funding from the Federal Ministry of Economic Affairs and Energy.

Their main task is to increase the transfer of technology from science to industry and the economic sector, especially to SMEs.

The "Innovation Program 2020" and "Cluster Strategy 2020" strategies of the Bremen region aim to strengthen the competitiveness of the region and provide sustainable employment in the long term. This includes expanding cooperation between industry and science, strengthening technology transfer, financing new businesses, and supporting cluster and network structures. Bremen's "STARTHAUS" initiative was launched in 2017 and provides a central point of contact for anyone wishing to establish a company in the region. This is a great advantage, especially for beginners. EcoMaT is a unique research and technology center created in Bremen. It brings together the existing competencies of the industrial and scientific sectors in the field of construction. Since 2019, the center houses around 500 scientific staff and industrial partners [16].

3.1.5. Brandenburg Region

The region enjoys great success with "Joint Labs", a special model of cooperation between universities and non-university research institutions. To strengthen the electronics industry in global competition, two institutes of the Leibniz Association, including the eleven institutes of the Fraunhofer Microelectronics Group and the Institute for High-Performance Microelectronic Innovations in Frankfurt, have developed several concepts for the microelectronics research factory in Germany. All this is financed by the necessary investments of the Federal Ministry of Education and Research. The federal state of Brandenburg supports the Center "Integration of Functions of Biological and Physical-Chemical Materials" coordinated by the Fraunhofer Institute for Applied Research for Cell Therapy and Immunology. It pursues the goal of bringing together the scientific competences of various scientific organizations, thereby strengthening research and industry in the Brandenburg-Berlin region. Leibniz's "Innovation Initiative Agriculture 4.0 project" initiated by the "Food and Nutrition Research Association" also includes the Leibniz Institutes of Agricultural Engineering and Bioeconomics, the Center for Agricultural Landscape Research, High Performance Microelectronics Innovations and other partners. This project prepares research proposals for collaborative projects that wish to address issues such as future opportunities and risks of digitized agricultural production, conservation of resources and the environment, value chains and relevance of consumer decisions. The Innovative Competence Center in Potsdam, which FEAB decided to fund for another five years in 2015, aims to become a leading international center in this field by conducting excellent basic research and developing innovative technological solutions [17].

Regional priorities and smart specialization are of high priority for the federal state of Brandenburg and are implemented within the framework of the "Berlin-Brandenburg Joint Innovation Strategy (innoBB)".

"Joint Innovation Strategy of the States of Berlin and Brandenburg (innoBB 2025)" Beginning as the first interstate

innovation strategy on the basis of the strategy “InnoBB 2011”, this strategy is the basis for maintaining close economic policy cooperation between the two federal states in the capital region. The vision of the innovation policy of InnoBB 2025 consists of two objectives: to make these two capital regions a leading innovation center in Europe and to create the right framework for the stakeholders in the clusters to develop innovative solutions. The main focus here is on the further development of five clusters considered particularly relevant for the entire region: Health Research; Energy Technology; Transport, Mobility and Logistics; Information and communication technology; Media and Creative Industries; Optics and Photonics [18].

The potential of the four Brandenburg-specific clusters (food industry, plastics and chemicals, metals and tourism) is also evaluated by the “Brandenburg Innovation Strategy InnoBB+”. The “InnoBB+ strategy” is funded by ABKF. The main objective of the “InnoBB +” strategy is to develop the capital region as an innovation hub for international competition. This is based on the construction and development of clusters with high growth potential. To achieve this goal, the Brandenburg Agency for Economic Development is running the project "Paths and strategies for sustainable cluster development and cluster-related challenges in Brandenburg 2018-2020". The main task of the cluster management involved in this project is to implement each basic plan in collaboration with the partners and to connect the players efficiently.

The "project for the development and implementation of sustainable cluster structures in Brandenburg and the capital city 2018-2020 (Cluster 2020)" is supported through the Ministry of Economic Affairs, Labor and Energy, funded by ABKF and the Federal State of Brandenburg. Brandenburg's cluster policy primarily aims to promote the growth of businesses. and by using investment incentives, it aims to increase its competitiveness in international markets.

3.1.6. Saxony-Anhalt Region

For more than ten years the state government of Saxony-Anhalt has been supporting and promoting the formation of clusters and networks. Through funding, the government primarily supports cooperation between companies, research and development institutions, eligible service providers, and other relevant partners and organizations. The following clusters and networks are funded by the federal government:

- Cluster Biotechnology in Saxony-Anhalt
- Central Germany Cluster in the Chemical / Plastics industry
- IT Central Germany Cluster
- “MAHREG” Automotive Cluster
- Medical and Health Technology Cluster of the State of Saxony-Anhalt
- Special machinery and plant engineering cluster in Saxony-Anhalt

“Regional Innovation Strategy for Saxony-Anhalt 2014-2020” this strategy has been jointly developed by representatives of economics, science and policy and is intended to serve as practical principles for the economic future of the state [29]. The goal of the Regional Innovation Strategy is to create and develop a closer network between science and economy, using existing advantages. As part of the Regional Innovation Strategy, five leading growth markets for the state were identified in intense dialogue with experts in economics, science and politics, taking into account the key potential and future global challenges in current science and economics in Saxony-Anhalt

[23]. Leading markets with future potential in Saxony-Anhalt: Energy, Engineering and Plant Construction, Resource Efficiency; Health and Medicine; Mobility and Logistics; Chemistry and Bioeconomics; Food and Agriculture. The Regional Innovation Strategy aimed to prioritize projects that are particularly relevant to innovative growth, in order to achieve the objectives and achieve an innovative science and workplace position in defined leading markets around the world.

NorthRhine-Westphalia region. The region works with state sponsored clusters, regional and issue-oriented networks by establishing close networks of all players along the value chain and building on existing strengths. In addition, the science network is also supported by the state government. The Stem Cell Network NRW, for example, concentrates all its research work in adult and embryonic stem cell research. The network is an initiative founded in 2002 and funded by the Ministry of Culture and Science of North Rhine-Westphalia. It consists of two working groups, namely Biomedical and Ethics-Law-Social Sciences. The network's tasks include consolidating activities in the field of stem cell research, developing young talent, and enhancing NRW's potential as an international location for stem cell research.

3.1.7. Hesse Region

Cluster networks and their development are an important area for Hesse's economic and innovation policy. Networks of new clusters in the region and start-ups merging in these clusters are supported by the government after a short preparatory phase during a three-year development phase, and even after they are successful. In addition, selected innovative projects for the further development of existing cluster networks are also supported.

The cluster support team of "Hessen Trade & Invest GmbH" and "HA Hessen Agentur GmbH" informs cluster networks of networking and further development and financing opportunities.

Subsidies to innovative ideas the state of Hesse supports innovative, technology-oriented research and development projects in business and science. The focus is on the development of new, marketable products, processes and services. Government-enforced funding is open to all subjects and sectors. The first step in financing is to submit a meaningful sketch to HA Hessen Agentur GmbH before the project begins. Here, finance professionals provide advice and support to companies and universities at the application stage and throughout the entire project. Since 2008, support teams have successfully supported more than 500 projects [26].

Factors for Success in Hesse: Knowledge Transfer and Innovative networking collaborates with around 3500 companies and network initiatives, and of course this is the basis for growth and business development. Investors find a unique pool of expertise for knowledge transfer, continuous improvement and cooperation in Hessen. Companies from many industries operate and achieve success in these clusters throughout the entire supply chain, because different technologies, competencies and knowledge areas participate in these clusters. Technology-Transfer-Network-Hesse (Technology-Transfer-Network-TTN-Hesse) combines technology transfer activities from businesses and universities into a single network, a unique model in Germany. TTN-Hesse builds bridges between publicly funded research and private companies.

Hesse has successful clusters in the medical and healthcare technology, automotive technology, mechanical engineering, optics and many other sectors. As we can see from Table 2, the best examples of how successful clusters contribute to dynamic economic development are

the following: RenMainNeckar automotive cluster, MoWiN.net for mobility and logistics, and deENet for renewable energy.

3.1.8. Thuringian Region

In the region, clusters are of economic and regional importance as they promote value creation and employment growth. The purpose of the region's cluster policy is to promote the development of efficient and innovative clusters, in particular, in line with the innovation strategy of "RIS3 Thuringia". Thuringia supports these processes both by providing initial financing to the cluster and by financing the further strategic development of clusters and networks. The comprehensive Thuringia Cluster Management organization, established at Thuringia's state development agency, supports the clusters and networks covered by the RIS3 Thuringia strategy, in particular strategic developments, through networking and cooperation with each other and the implementation of joint projects.

"Regional Research and Innovation Strategy for Intelligent Specialization (RIS3 Thuringia)" the regional RIS3 strategy was adopted in 2014. The strategy was coordinated by industry and cluster policy within the Ministry of Economy, Labor and Technology in close collaboration with the Ministry of Education, Science and Culture and the Thuringia Cluster Management Organization (ThCM). The strategy is recognized as the core document for the state's future research and innovation strategy [27].

Thuringia Cluster Management Organization - was established by the Ministry of Economic Affairs, Science and Digital Society, and ThCM works on behalf of Thuringia's Ministry of Economy, Science and Digital Society and is funded by the EU. ThCM's mission is to strengthen existing clusters in Thuringia, to support and develop networks between the research and business sectors, to increase the innovation performance and competitiveness of regional companies, to aim for the integration of regional actors to bring together available resources and potentials. ThCM deals with various growth areas, industries and five cluster areas:

- Industrial production and systems the mainstay of the Thuringian economy and has strong entrepreneurship in Thuringia in manufacturing technology, machine and tool making, micro and nanotechnology, optics and robotic systems and particularly strong thanks to 7 Thuringian universities and 15 research institutions.
- Sustainable and smart mobility and logistics.
- Life sciences and health one of the fastest growing and most employable sectors in Thuringia. His area of expertise includes wellness, medical technology, biotechnology, pharmacy, and is located at 6 universities, including 3 universities, 3 universities of applied sciences, 15 research institutions, 2 technology centers, as well as 26 clinics and outpatient clinics of the Jena University Hospital. can be found.
- Sustainable use of energy and resources.
- ICT, innovative and manufacturing related services.

3.1.9. Region of Saxony

The region has been an excellent place for industry and advanced technology from the early stages of industrialization until today. With research and training opportunities built and expanded to complement the region's economic strengths, an innovative mass has been created, above all in the field of microelectronics, for clusters spread across Europe. "Cool Silicon" Pioneer cluster in Saxony Cool

Silicon cluster, which aims to increase energy efficiency in the field of ICT, was founded in 2009. Today, 60 companies and research institutes from Saxony, the leading microelectronics region, are organized in the Cool Silicon cluster. The key sector here is modern ICT. Within the Cool Silicon cluster, these key competencies are used to develop efficient solutions in the fields of information, mobile communications and sensor technology. The key to success is an intensive exchange of ideas between partners working in different fields and the transfer of know-how from academia to industry, as well as technical knowledge. "Cool Silicon" aims to seize the opportunity to massively improve the system capability of the location, especially in cooperation with SMEs, in order to develop key technologies for energy-efficient electronics and make them safe for the region, Germany and Europe for a long time.

"Zwanzig20 Partnership for Innovation project" With an allocation of up to 500 million Euros, the "Zwanzig20" program systematically analyzes outstanding economic and scientific competences built for the future in East Germany through national and interdisciplinary cooperation. aims to develop, identify future issues of high social and economic importance and develop economically sustainable solutions for them. To this end, the funded project cooperates with more than 100 partners and these partners are considered open and transparent partnerships and are therefore open to new cooperation partners during the implementation phases [28].

3.1.10. Rhineland Palatinate Region

"Rhineland-Palatinate Innovation Strategy" this strategy is linked to the high-tech strategy of the German Federal Government at national level and is included in the "EU 2020 Strategy" in relation to the European level. The "Rhineland-Palatinate Innovation Strategy" has been developed through a period of intensive work with the participation of academic research, business, administration and government representatives, building on the government's previous strategic innovation policy approaches. This strategy includes the support of ABKF especially for the period 2014-2020. This innovation strategy primarily addresses high potential areas with the greatest regional competitive advantages and characteristics. The Innovation Strategy has the vision to make the Rhineland-Palatinate state one of the leading innovation regions in Europe, together with all the players in the regional innovation system. The basis for this is innovative and successful businesses, especially SMEs, and high-profile research institutions at the national and international level. Since the overall objective of this Innovation Strategy is to strengthen the innovative power and competitive position of the province, five strategic objectives have been put into practice along the innovation chain:

- Research and technological developments in universities, universities of applied sciences and research institutes will further strengthen Rhineland-Palatine and continuously will develop as.
- The innovative performance of the economy will also be increased. In particular, SMEs will expand their R&D projects through support and accelerate the release of their inventions.
- The intensification of knowledge and technology transfer will be a vital objective of this Innovation Strategy to contribute to a knowledge-based development of the economy.
- It will help increase efforts to startup businesses in this region and develop the technology-based potential of businesses.

- It is the Innovation Strategy's task to support cooperation, networking and innovation in Rhineland-Palatine through the promotion of networks and clusters.

3.1.11. Saarland Region

Saarland's innovation strategies have brought together the most competitive competencies and technology areas of the region and increased the use of this potential. Part of the strategy consists of approaches related to the development and use of innovation and funding tools to improve cooperation between universities, business and research. To this end, clusters have been created, where training and research organizations as well as companies' network with each other and deliberately work on joint projects, products and value chains. Saarland's innovation clusters:

- It.saarland
- Biokom.saarland (nanobiotechnology, pharmaceutical)
- automotive.saarland (automotive supply industry)
- information. saarland (specifically, e-learning)
- logistics.saarland (logistics and IT)
- energie.saarland

Baden-Württemberg region. Cluster policy of the federal state of Baden-Württemberg- This cluster policy is characterized by strong dialogue management and active integration of all relevant cluster actors to create sustainable and self-supporting structures [30]. Cluster policy is a central element of the federal state's innovation policy, which aims to strengthen the innovation capacity and competitiveness of small and medium-sized companies. Numerous companies, research institutes and universities are integrated into regional cluster initiatives and networks at the federal state level. Support for clusters according to this policy:

- Foundation of ClusterAgentur Baden-Württemberg
- Financial support for innovative projects of cluster initiatives
- Promoting the internationalization of cluster initiatives
- Organization of cluster activities at federal state and regional level
- Studies on cluster-related issues
- Transparency and information

"ClusterAgentur Baden-Württemberg" a service provider for cluster initiatives, regional networks and cluster policy in Baden-Württemberg. As a partner of cluster management and cluster initiatives, it assists clusters in their further professionalisation. In addition, ClusterAgentur assists the Ministry of Economic Affairs, Labor and Housing in implementing Baden-Würtemberg's cluster policy. "Baden-Württemberg Regional Cluster Atlas" the Regional Cluster Atlas is aimed at companies and business development institutions and provides basic information about Baden-Württemberg's nearly 110 regional cluster initiatives, statewide networks and government agencies. The cluster atlas also covers cluster-related research, development and transfer opportunities in the regions of the country. It shows the diversity of innovations in cluster initiatives and networks in the state, and which clusters, cluster initiatives and nationwide networks exist across industries, technology, as well as regions.

The "ProRegioINNO" program (5.6 million euros for regional innovation activities) - Minister of Economy Nicole Hoffmeister-Kraut has officially presented a new funding program aimed at strengthening innovation in the Baden-Württemberg region. The "ProRegioInno" program

is supported by a total of 5.6 million euros, of which 4 million euros comes from ABKF. This program consists of four components to strengthen the innovation power of the region: 1. Promotion of regional innovation management; 2. Development of regional innovation infrastructures in densely populated regions; 3. Regional business forums; 4. Provision of new consultancy services from ClusterAgentur Baden-Württemberg.

"ERDF program Baden-Württemberg 2014-2020 (Innovation and Energy Transition)"- ABKF is an EU structural fund that promotes economic, regional and social cohesion within the EU. The Baden-Württemberg region receives funding from ABKF for the period 2014-2020 with the principle of "Innovation and Energy Transition". The operational program focuses on the country's strengths and specifically supports the reduction of CO_2 emissions as well as research and innovation [32].

"ERDF program Baden-Württemberg 2021-2027" in agreement with the European Commission, the European Council and the European Parliament in May 2018, it aims to promote employment, innovative and sustainable growth in the European Union in the 2021-2027 period. In developed regions such as Baden-Württemberg, ABKF's regional funding will continue to focus on the implementation of research, development and innovation as well as issues such as environmental economics and bioeconomics. This program builds directly on the 2014-2020 ABKF program "Innovation and Energy Transition".

3.1.12. Bavaria Region

Aviation in the federal state of Bavaria with approximately 38,000 employees, produces annual sales of more than 10 billion euros. Bavaria covers the entire value chain in the aerospace industry, from research to development, production and service support, and its research infrastructure is perfectly trained with 18 established research institutions and universities. Automotive the cluster consists of up to 600 companies and institutes from the automotive industry and all automotive-related specialties. Railway Engineering The German railway industry annual sales are around EUR 10 billion and therefore the world market share is around 15 percent. Bavaria is home to some of the largest and most important German suppliers of rail transport. Forestry and Wood - forestry, wood and paper industry is an important industry in Bavaria with an annual turnover of 37 billion euros and 196000 employees. This cluster covers the value chain related to this field. The value chain includes, for example, forestry, woodworking industry, predominantly the international paper industry.

3.2. The characteristics, Successful Examples and Importance of Clustering Strategies and Policies Implemented in Türkiye for The Türkiye Economy

The foundations of clustering policies in Türkiye began in the 1960s during Türkiye's planned development period led by the State Planning Organization (SPO). The aim was to help firms become internationally competitive, and the state began using a variety of policy tools to support geographical convergence. Despite ongoing developments and efforts, Türkiye lacked a systematic plan for a national clustering policy until the early 2000s.

The first approach to clustering in Türkiye was Organized Industrial Zones and Small Industrial Sites in the 1960s. OIZs have proven to be an effective tool in terms of their impact on industrial production and job creation in Türkiye. But despite all this, from the early 1970s to the early 2000s, Türkiye did not have a clearly defined policy tool and strategy to promote industrial clusters.

In the 1990s, Technology Development Centers (TEKMER) were established within universities under the guidance of "KOSGEB (Small and Medium Enterprises Development Organization)". And these technology centers have played an important role in the formation of clustering policies in Türkiye. The period of 1990 was a time when new incentives for technology adoption and use were implemented.

Türkiye started to create and implement new clustering policies in the early 2000s. The first initiative was the "CAT-Competitive Advantage of Türkiye project", which was later developed as the International Competitiveness Research Institute (URAK). The CAT project started its activity by supporting cluster initiatives such as the Tourism cluster in Sultanahmet (Istanbul), the competition and cluster analysis for the city of Bartın in Ankara and the OIZ (OSTİM). After the successful conclusion of Türkiye's Competitive Advantage project, the project team continues to work as the International Research Institute (URAK).

UNDP has undertaken several clustering initiatives in collaboration with the small and medium corporate development project in Southeastern Anatolia. Adıyaman textile, Şanlıurfa organic agriculture and Diyarbakır marble clustering initiatives are a few examples. The first Clustering project financed by the EU in Türkiye is "Establishment of Fashion and Textile Cluster" (2005-2006). The main beneficiary of the project, the Istanbul Textile and Apparel Association (ITKIB), aimed to increase networks between SMEs in the textile and apparel industry at local, national and European levels.

The second clustering project funded by the EU is the "National Clustering Policy Project", which started in 2007 and ended in 2011. This project is an important step in defining Türkiye's clustering strategies and is one of the most comprehensive studies to analyze the current situation of clusters and cluster policies in Türkiye by offering strategic recommendations for the near and far future. The main objective of the project is to create a National Clustering Policy for Türkiye and to increase the international competitiveness of SMEs by encouraging interaction between Türkiye and European clusters and to have three components. The first component is to increase the capacity of institutions; the second component is strategy development; The third component is cluster mapping and analysis. This project produced a roadmap for 10 clusters in Türkiye. Identified clusters Mersin processed food (Mersin processed food), Ankara machinery (Ankara machinery), Konya automotive parts (Konya automotive parts), Eskişehir-Bilecik-Kütahya ceramics (Eskişehir-Bilecik-Kütahya ceramic), Manisa electronics (Manisa electronic), Ankara software (Ankara software), Denizli-Uşak home textile (Denizli-Uşak home textile), Muğla yacht building (Muğla yacht building), İzmir organic food (İzmir organic food) and Marmara automotive parts (Marmara automotive parts).

The third project, co-financed by the European Union and the Republic of Türkiye, is the "SME Network Project", which was launched in July 2011 and lasted until 2013. The aim of the project is to improve the network and cooperation between developed and underdeveloped regions of Türkiye by developing and implementing cluster-based interregional networking and cooperation strategies. The project is carried out in five areas in cooperation with regional chambers of commerce and industry - Gaziantep, Çorum, Kahramanmaraş, Samsun and Trabzon.

"Türkiye's 2023 Export Strategy" the aim of this strategy is to raise Türkiye's exports to a level of 500 billion dollars and to rank among the world's top 10 economies. Türkiye has been late in establishing a systematic and unified national approach to forming

clusters, but the issue has been handled much more professionally in both the public and private sectors and universities in the last decade, and the recent developments in clusters and clustering policies have shown promising results. Türkiye aims to compete globally in the sectors in which it is successful, and although it is not easy, there is much more to be researched and done in terms of clustering. Therefore, the "Cluster Policy Project" is a promising example and provides solid frameworks for what needs to be done now and in the future. Thanks to relevant structural reforms and strategies, Türkiye has the potential to steer its economic environment towards a structure that helps clusters in various sectors increase productivity and help businesses successfully compete and lead in global markets.

Türkiye's Ministry of Science, Industry and Technology, in order to develop the textile sector, to increase the potential of the cluster consisting of these sectors to compete at the international level by producing high quality products oriented towards innovation, knowledge and advanced technology, and to bring Türkiye to the position of a developed country in this field. Ready-made Clothing and Leather Products Sectors Strategy Document and Action Plan" has been implemented. These projects aim to increase the market share at the international level by improving the competitive power of the textile industry, to create and develop a qualified workforce with innovation and R&D studies, to create a high-quality production infrastructure of this sector, to promote it both at home and abroad, to promote all these activities to the environment. and without harming the nature, using resources at a sustainable level, and other areas. THD sectors, on the basis of this strategy, programs and plans such as "Ninth and Tenth Development Plans", "2023 Turkish Export Strategy", "Strategic Plan and Cluster Support Program" of the Ministry of Science, Technology and Industry, the creation of a cluster in this area and ultimately Türkiye aimed at promoting the economic development of Türkiye's "The Ninth Development Plan of Türkiye (2007-2013)" includes policies related to clustering comprehensively. The main purpose of the plan is to increase the role of R&D studies and advanced technology in the textile and ready-made clothing sector, to accelerate competition, to produce quality products, and to support the creation of brands at both national and international levels. The "Tenth Development Plan (2014-2018)" aims to ensure the stable development of the textile and ready-made clothing industry, to increase its international competitiveness, to protect the environment and to use resources in a sustainable way, as well as to create an international brand, and thus stable economic growth. supports.

4. RESULTS

4.1. "KOSGEB: Cooperation and Collaboration Support Program"

KOSGEB was established in 1990 with the support of the Ministry of Science, Industry and Technology of Türkiye in order to increase the impact and competitiveness of medium and small-sized enterprises and to support their exports and Research and Development studies. Later, KOSGEB accepted the Cooperation and Collaboration Support Program in the amount of 1500000 TL in order to bring these enterprises together, to create cooperation among them in all fields of activity, to support projects involving innovation and advanced technology. This program consists of 3 models:

- Enterprises participating in the project should be partners of the union to be established while preserving their independence, that is, their existence;

- ❖ Enterprises participating in the project, either in whole or in a few, should be included in the union to be established by accepting their cancellation;
- ❖ Several of the enterprises participating in the project should agree to their cancellation and merge into one of them. For the purpose of the program to be realized, at least 5 of the companies participating in the project; If this project is implemented in the fields related to Medium and High Technology, then at least 3 companies must come together and cooperate. The duration of the project is determined as 6 and 24 months, and it is possible to extend it for an additional 12 months. The amount of financial support is 1000000 TL, and 1500000 TL for Medium and High Technology fields. Of the 1000000 TL financial support, 300000 TL is non-refundable and 700000 TL is reimbursed. 300.000 TL of the 1500000 TL financial support allocated for Medium and High Technology areas is non-refundable and 1200000 TL is reimbursed.

Geographical Concentration of the Turkish Textile Industry According to employment numbers, number of companies and export figures, textile and ready-made clothing production is mainly concentrated in three geographical regions in Türkiye Marmara Region, Aegean Region and Çukurova region. Marmara Region: Textile activity in the Marmara region is concentrated in the provinces of Tekirdağ, Istanbul and Bursa. The Marmara Region constitutes the largest textile cluster for the Türkiye economy. The region hosts approximately 67% of the total textile-related companies and realizes 71% of the total textile exports within the Turkish economy (Ministry of Labor and Social Security Statistics). The main production activities are garment manufacturing, yarn production, knitting and textiles. Aegean Region: The Aegean region is focused on home textiles. It has 12% of textile employment in Türkiye, is responsible for 10% of total textile exports and houses 11% of total textile companies. Çukurova Region: Finally, Çukurova is a promising region for textile production in Türkiye. This region is seeing strong growth in textile exports, textile employment and textile-related companies. The main products of the region are machine-made carpets, rugs, yarn production and weaving and finishing of cotton.

4.2. BURTEX Cluster

Bursa province is the textile capital of Türkiye as it specializes in the textile industry. This cluster is an industry that exports more than 2 billion dollars, covering more than 160 countries, with more than 100000 skilled labor, innovation and advanced technology activities.

BTSO (Bursa Chamber of Commerce and Industry), which supports the BURTEX cluster with its projects for innovation, is implementing the "URGE project" with the support of Türkiye's Ministry of Economy, in order to further develop Bursa's textile industry. All parties of the cluster – universities and research institutions, government and private institutions – are opening up to international markets by taking advantage of this project. In addition, the Textile Council was established in order to develop new strategies, engage in mutual activities jointly, contribute to R&D studies and strengthen cooperation between universities and industry sectors. In addition, the Textile Center was created to strengthen innovation-oriented and high-quality production in the textile industry. The main goal of this center is to increase Türkiye's market power at the international level by applying advanced technology in production and producing smart and high-quality textiles. BUTGEM (Bursa Design and Technology

Development Center), which aims to further increase the innovation-oriented textile industry, especially fashion design, aims to train well-trained designers through training provided by experts. Because of all these and other such innovations, Bursa is now an example of a successful cluster as one of the world's special textile centers.

İzmir Organic Food Cluster Study this cluster started its own studies in 2008 and is one of Türkiye's successful projects on clustering. This project was presented to the public in 2009 after establishing the cluster's vision and mission, strategy and cluster roadmap. The project includes other such activities, from setting up the cluster to conducting market and consumer research, creating training programs for the members of the cluster and laboratories for testing products, establishing both retail and wholesale stores for products to be sold, creating a brand. The main purpose of this project is to increase the competitiveness and innovation capacity of all sectors, covering all stages and parties from the production of organic food to the consumption by the final consumer, both at the national and international level, and to create Türkiye's clustering policy in this field. Meetings in which representatives, firms and companies of the countries that are successful in the organic food sector of the European Union operate in İzmir, "Ecology İzmir Event" where a series of organic food products are introduced, "Creation of Ekopazar İzmir and Buca Karaağaç Organic Village", "Organic Agriculture Project", "Improving International Competition for Organic Products Project" are the main factors that ensure the success of the İzmir Organic Food Cluster study.

Marmara Automotive Cluster Study this cluster is concentrated in the Eastern Marmara Region of Türkiye and employs more than 45000 people. For this reason, it is considered as one of the 13 major clusters of Europe. But this assessment was based on employment alone. Factors such as productivity, science, added value and technology, which are the main factors of the cluster, were not taken into account. In order to eliminate all these deficiencies and to develop innovation and technology, the "Capacity Building Project for Automobile Clusters (OKUMKAP)" started its own studies in 2008.

5. CONCLUSIONS AND RECOMMENDATIONS

While researching the thesis topic "The importance of clustering model and policies in economic development: Germany and Türkiye country examples", in the first chapter, it is stated that clusters that increase economic development and competitiveness increase the relations of innovation in our modern world, create new products and new companies and combine the activities of entrepreneurs and local government institutions. We have seen medium-sized companies increase their international competitiveness and clusters at the end of the split have positive outcomes for both local companies and regional economies driving economic growth. In the second section, there is a mutual relationship between the clustering model and the value chain theory, that the methods and techniques used by Germany to create clusters are very successful, and that Türkiye, which is the other model country, has a more successful clustering policy in the readymade clothing and textile sector and contributes to the country's economy. We analyzed their contribution. A key feature of the creation of clusters is a high level of trust among cluster participants. For the creation of this trust, the formation of social capital is a very important factor. This means a high level of trust and agreement among all the actors in the cluster. Civil society, research institutes and universities should trust the business sector and government, and the government should trust them all and take into account the opinions of

each participant in decision making.

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