

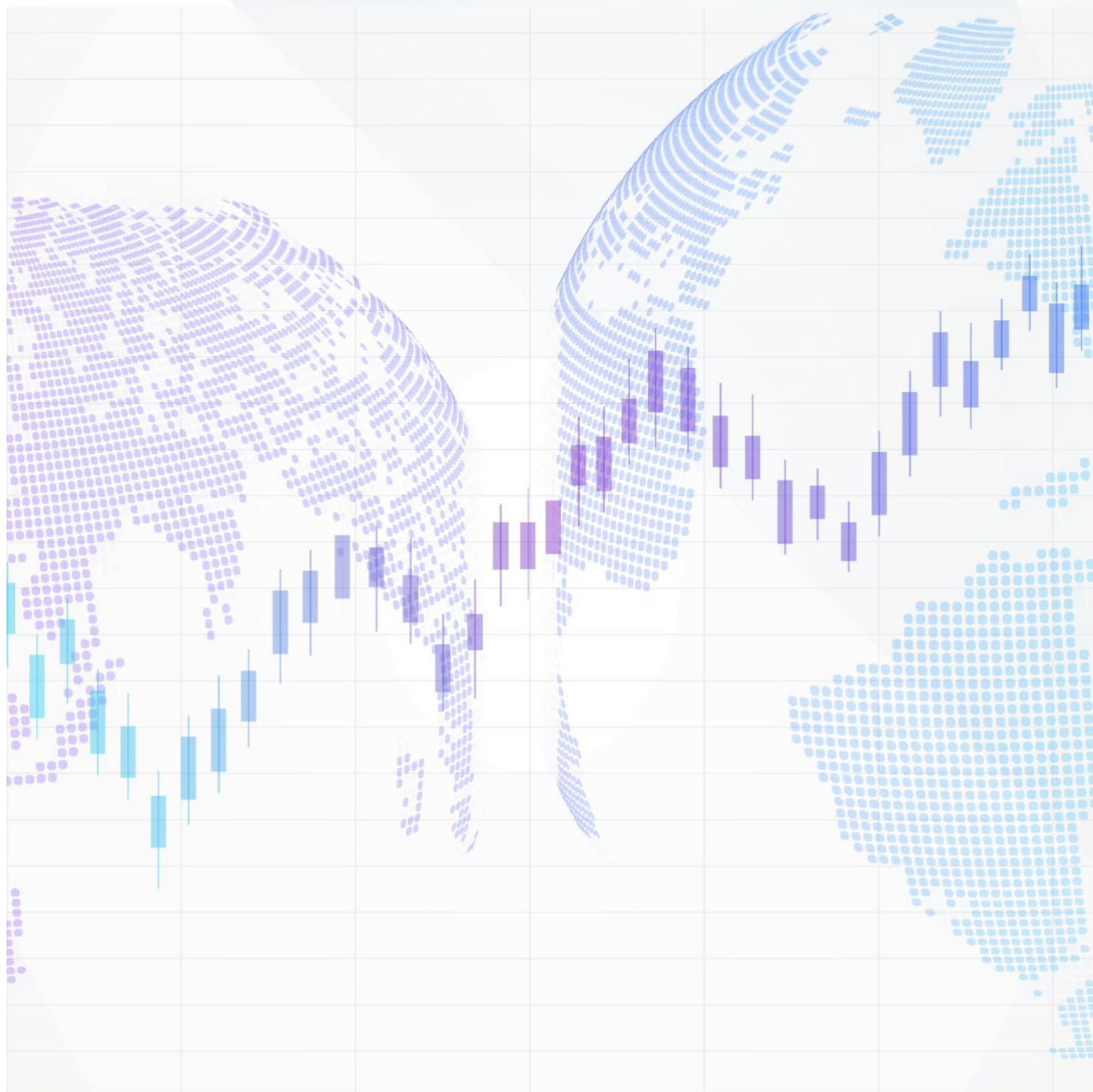


SAKARYA UNIVERSITY
OF APPLIED SCIENCES

JOIN BAT

JOURNAL OF BUSINESS AND TRADE

Volume: 6 | Issue: 01 | Year: 2025 | e-ISSN: 2757-6809





Journal of Business and Trade



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İÇİNDEKİLER / CONTENTS

Makaleler/Articles

1. Marka Tescilinin Uluslararası Ticaretteki Yerinin Menşei ve Garanti Fonksiyonu Açısından İncelenmesi
Süheyla Türkmen, Füsün Çelebi Boz.....1-19
2. The Importance of Market Returns in Financial Return Analysis: US Air Carriers
Olca Ölçen.....20-33
3. Perceptions of the Barriers to Localization Before and During the Covid-19 Pandemic: “A Case of Turkish Machinery Manufacturers”
Tuğba Onur, Büşra Garip, Ayşegül Karataş.....34-55
4. Kesirli Diferensiyel Denklemlerle Finansal Problemlerin Matematiksel Analizi ve Çözüm Yöntemleri
Engin Can.....56-67
5. Analyzing State-Nation Building in Fragmented Societies: A Case Study of Afghanistan (2002-2021)
Sayed Nasim Bahman, Dilşad Türkmenoğlu Köse.....68-91

Marka Tescilinin Uluslararası Ticaretteki Yerinin Menşei ve Garanti Fonksiyonu Açısından İncelenmesi

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ÖZET

Markaların varlığı tüketicilerde ürünlerin kaliteli olduğuna ve bu kaliteyi sürdüreceğine dair inanç oluşturmaktadır. Bu nedenle marka yönetimi, bir işletmenin başarısı için kritik öneme sahiptir. Doğru yapılmadığında piyasadaki konumu ve müşteri algısı olumsuz yönde etkilenebilmektedir. Bu, sadece kısa vadeli satış kayıpları değil, aynı zamanda uzun vadeli marka değerinde de kayıplara neden olmaktadır.

Markanın garanti fonksiyonu üretilen malın veya sunulan hizmetin hep aynı kalitede olduğunu ortaya koymaktadır. Tüketiciler aynı kaliteden yararlanmak amacıyla aynı markaları tercih etmekte olup yeni markaları denemekte ise tereddüt duymaktadırlar. Markanın garanti işlevini yerine getirip tescilli olan mal veya hizmetini her zaman aynı standart ve kalite de sunmaya çalışması en önemli yükümlülüğüdür. Bu yükümlülüğü yerine getirmediğinde ya da getiremediğinde karşılaşılabilecek sorunla başa çıkma şekli markanın duruşunu, imajını ve değerini belirlemektedir.

Markanın menşei fonksiyonu ise; markanın ulaşmak istediği hedef kitle tarafından kabul gördüğü ve ait olduğu ülke, bölge veya yer olarak açıklanmaktadır. Markanın var olduğu lokasyon ve yer aldığı pazar bilgisinin tüketici tarafından biliniyor olması tüketicinin kalite algısını etkilemektedir. Hedef kitlenin kültürü, sosyal yapısı ve alışkanlıkları, coğrafi yapının fiziki ve sosyal özellikleri gibi etkenlerin de markanın menşei özelliklerini belirlediği anlaşılmaktadır.

Bu çalışmada uluslararası bir marka olma yolunda hareket eden bir çikolata firmasının yönetimindeki eksiklikleri markanın garanti ve menşei fonksiyonları üzerinde değerlendirilmiş ve çalışma sonucunda bu fonksiyonlarını yerine getirmediği anlaşılmıştır. Ayrıca bu fonksiyonların yerine getirilmemesinin sosyal medyada geri dönüşleri incelenmiş, görülen eksiklikler ve olumsuzlukların markanın doğru yönetilememesi ile de paralel olduğu kanısına ulaşılmıştır. Dolayısıyla markanın hukuki metinler ve kurallar üzerinden incelenmesinin marka yönetiminde yeterli olmadığı sonucuna varılmıştır.

Anahtar Kelimeler: Marka, Marka Yönetimi, Uluslararası Ticaret

Jel Kodlar: M16, M3, M37

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Cite as: Türkmen, S. & Çelebi Boz, F. (2025). Marka Tescilinin Uluslararası Ticaretteki Yerinin Menşei ve Garanti Fonksiyonu Açısından İncelenmesi, *Journal of Business and Trade*, 6(1), 1-19.

<https://doi.org/10.58767/joinbat.1536697>

*Tanınmış Marka Kavramının Garanti İşlevinin Değerlendirilmesi ve Uluslararası Ticarete Yansıması isimli tezden türetilmiştir.

The Importance of Trademark Registration in International Trade Inspection in Terms Origin and Warranty Function

ABSTRACT

The existence of brands creates a belief in consumers that products are of high quality and will maintain this quality. Therefore, brand management is critical to the success of a business. When it is not done correctly, its position in the market and customer perception can be negatively affected. This leads not only to short-term sales losses but also to in long-term brand equity.

The guarantee function of the brand ensures that the goods produced or services provided are always of the same quality. Consumers prefer the same brands in order to benefit from the same quality and are hesitant to try new brands. The most important obligation of the trademark is to fulfill its guarantee function and to always try to offer its registered goods or services at the same standard and quality. The way it deals with the problems it will face when it does not or cannot fulfill this obligation determines the stance, image and value of the brand.

The origin function of the brand is explained as the country, region or place where the brand is accepted by the target audience that the brand wants to reach and where it belongs. The fact that the location and market information of the brand is known by the consumer affects the consumer's perception of quality. It is understood that factors such as the culture, social structure and habits of the target audience, physical and social characteristics of the geographical structure also determine the origin characteristics of the brand. In this study, it is analyzed whether a brand is on its way to becoming an international brand.

Keywords: Trademark, Trademark Management, International Trade.

Jel Kods: M16, M3, M37

GİRİŞ

Marka kavramının kökeni, ticaretin başlangıcına kadar uzanmaktadır. İnsanlar, ürünlerini tanımlamak ve farklılaştırmak için tarih boyunca çeşitli semboller, işaretler ve isimler kullanmışlardır. Ancak modern anlamda marka yönetimi ve marka tescili pratikleri, sanayi devrimi ve endüstriyel dönemle birlikte daha belirgin hale gelmiştir.

Marka (brand) kelimesi İskandinav toplumunda 'yanmak' anlamında kullanılan ve kökeni sıcak bir üttünün bıraktığı iz anlamına gelen 'brandr' kelimesinden türetilmiştir (Tosun, 2017). Marka, satıcı veya satıcı grubunun mal veya hizmetinin diğerlerinden ayırt edilmesi için tasarlanmış isim, terim, işaret, sembol, tasarım veya bunların bileşiminden oluşur (Kotler, 1991).

Markalar, tüketiciler arasında farkındalık yaratmak, tercih edirlilik oluşturmak ve sadakat sağlamak için önemlidir. İyi bir marka, müşterilere güven verir, onların duygularına hitap eder ve belirli bir ürün veya hizmeti rakiplerinden ayırmaktadır.

Marka bir veya bir grup satıcının malları veya hizmetlerini saptamaya ve bu malları ya da hizmetleri rakiplerinkinden farklılaştırmaya yarayan ayırt edici isimler veya sembollerdir (Aaker, 2009). Keegan ve Green'e göre ise marka "müşterilerin zihnindeki imajların ve deneyimlerin karmaşık bir toplamı" olarak tanımlanmaktadır (Keegan, Warren, ve Mark, 2005: 330).

Marka yönetimi, bir markanın yaratılması, geliştirilmesi, korunması ve güçlendirilmesi sürecini içeren stratejik bir disiplindir. Marka yönetimi, bir markanın algılanan değerini artırmayı, tüketiciler arasında farkındalık ve tercih edirlilik oluşturmayı ve böylece uzun vadeli başarı elde etmeyi amaçlar. Markanın garanti fonksiyonunun devamlılığı uzun vadede marka sürdürülebilirliğini ortaya koymaktadır.

Markanın ekonomik açıdan önemli fonksiyonlardan biri garanti fonksiyonudur. Her ne kadar marka sahibinin hukuken mal veya hizmetin kalitesini devam ettirmek gibi bir yükümlülüğü bulunmasa da, elde edilen itibar ve müşteri potansiyelini korumak isteyen marka sahibi ekonomik açıdan bu hususa özen

göstermek durumunda kalmaktadır. Marka sahibi bakımından bu zorunluluk, hukuken getirilecek bir zorunluluktan daha etkili olabilmektedir (Çamlıbel, 2001: 35).

Markanın garanti fonksiyonu aynı zamana da satılan mal ya da hizmetin satıştan sonraki bakımı, tamiri yahut ikamesinin sunulması gibi satış sonrası hizmetlerin de üretici veya satıcı tarafından karşılanmasını ifade etmektedir.

Markanın menşei fonksiyonu ise malın kim tarafından nerede üretildiği, kim tarafından piyasaya sürüldüğüne dair tüketici bilgi sahibi olmaktadır. Modern markanın temeli olarak ifade edilen işaretlerin sahip olduğu asli fonksiyon köken/kaynak gösterme fonksiyonudur (Memiş Tekin Fikri Mülkiyet Hukuku Yıllığı 2010, Paslı, 2014, s:28). Bu kapsamda ticari hayatın gelişmesi, pazarlama ve üretim yöntemlerinin değişimi ve dağıtım sistemindeki teknolojik ilerlemeler nedeniyle, markanın temel fonksiyonu olan menşei fonksiyonun önemini yitirdiği ve bu bilgilere ulaşmanın zor olduğu düşünülmektedir. Tüketicilerin markalardan, markalı mallardan bekledikleri kendileri için önemli olan niteliklere sahip olmalarıdır, kısacası markaların, markalı malların tüketicilerin isteklerine cevap vermesi daha spesifik bir hale gelmiştir. Alıcılar bir defa bu beklentilerine kavuştular mı onlar için markanın işletmesel kökeninin pek bir önemi kalmamaktadır (Shanahan, 1982:239). Ancak zamanla menşei gösterme fonksiyonu kaynak göstermekten ziyade bir kimliklendirme gibi işletmelerin birbirinden ayrılmasını sağlayan hatta mal ve hizmetleri ayırmaya yarayan bir fonksiyon haline gelmiştir.

Yapılan çalışmada literatürde yer alan tanımlardan yola çıkılarak marka kavramı ve markanın tarihsel gelişimine yer verilmiştir. Aynı zamanda markanın varlığı, stratejisi; markanın nasıl yönetilmesi gerektiği ve nasıl yönetilemeyeceği en önemlisi markanın menşei gösterme fonksiyonu ve garanti fonksiyonunun tüketici üzerindeki etkileri ve tüketicinin bu fonksiyonlardan beklentileri konuları da değerlendirilmiştir.

“Markanın garanti fonksiyonu” ve “markanın menşei gösterme fonksiyonu” konularının detaylı incelenmesi ve marka ile ilgili kavramların net şekilde açıklandığı bu çalışma literatüre özgün bir değer katacağı düşünülmektedir. Literatürde marka ve fonksiyonları konularında daha çok mevzuat ağırlıklı çalışmalar yer almakta olup, bu çalışma yaşanan olayın değerlendirildiği betimleyici bir çalışma olması açısından diğer çalışmalardan farklılaşmaktadır.

1. Marka Kavramı, Tanımı ve Tarihsel Gelişimi

Günümüz iş hayatının vazgeçilmez parçası haline gelen marka kavramı ve bu anlamda bir şirketin mal veya hizmetlerini diğerlerinden ayırma fikri çok eskilere dayanmaktadır. Öyle ki, bazı yazarlar, markanın mevcut tanımına ve yasal korumasına tam olarak uymasa bile, nesne bulunmadan önce marka olgusunun zaten var olduğuna inanmaktadır (Oytaç, 2002). Antik Yunan, Eski Mısır, Çin, Roma, Mezopotamya gibi dünyanın farklı yerlerinde yaşamış kültür ve medeniyetlerin kalıntıları da marka kavramının çok eski bir tarihe sahip olduğunu nesnel olarak karşımıza çıkmaktadır (Kurt, 2016).

Eski Türkler tarafından da Orta Asya coğrafyasında hayvan sürülerini birbirinden ayırt etmek için hayvanlar üzerinde “tamga” (pul) olarak adlandırılan ve daha sonra ticari hayatta kullanılmaya başlanan sembol ve işaretlerdir. Türk pulları, markanın özündeki farklılığı, farkındalığı ve anlamları taşıması bakımından markanın tarihsel gelişimi açısından oldukça önemlidir.

18. yüzyıl yılın ortasında İngiltere’de başlayıp Avrupa’ya yayılan Sanayi Devrimi, markanın tarihsel gelişiminde bir dönüm noktası olarak nitelendirilmektedir. Markanın bugünkü anlamıyla kullanımı ancak sanayi devrimi ile birlikte gerçekleşmiştir (Çolak, 2018). Mekanizasyon ve seri üretimle birlikte malların uzak diyarlara taşınması, ticari hayatı hızlandırmış, bunun sonucunda da malları birbirinden ayırt etme işlevi gerekli görülmüş marka olma durumu zorunlu hale gelmiştir.

Sanayi Devrimi'nin etkileri Osmanlı İmparatorluğu'nda da özellikle küçük zanaatkarlar arasında hissedilmiştir. Ürettikleri kaliteli ürünlerin hem ucuz hem de kalitesiz olan benzer ithal ürünlerden ayırt edilemediğini gören kuyumcular tüketici zararının farkına varmış, bu konuyu kethüdaları ile devlete getirmişler ve bunun üzerine kuyumcılara “İstanbul İşi” damgası vurulmuştur (Akay, 2020).

1857 yılında marka ile ilgili ilk mevzuat Fransa'da çıkarılmış ve markayı tescil kapsamına alan ilk ülke 1870'lerde Amerika Birleşik Devletleri olmuştur (Hacıömeroğlu vd. 2020). Sanayileşme ile birlikte uluslararası ticaretin ön koşulu olarak uluslararası anlaşmalar yapılması ihtiyacı ortaya çıkmış ve bu kapsamda ilk olarak ulusal anayasa hukuku olarak kabul edilen 1883 tarihli Sınai Mülkiyetin Korunmasına Dair Paris Sözleşmesi yürürlüğe girmiştir. Günümüzün küreselleşen dünyasında artan rekabetle birlikte ülkeler, işletmeler için oldukça önemli olan markayı korumak için yasalarını uyumlaştırmaya çalışmışlardır (Aker, 2021).

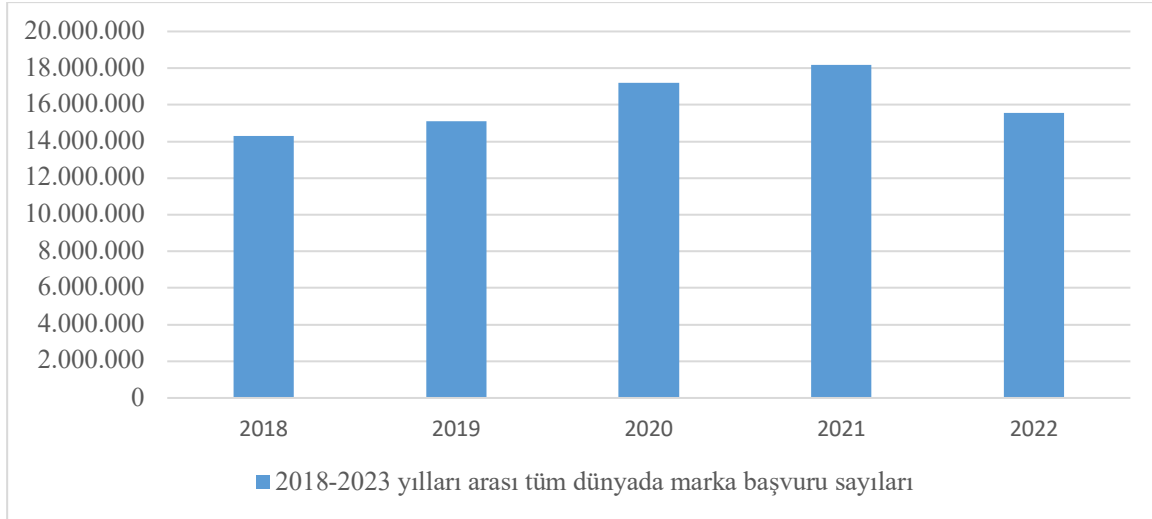
Markanın bugüne kadar pek çok tanımı yapılmış olsa da, bu kelimenin etimolojisine baktığımızda İngilizce bir kelime olan ve Türkçe karşılığı “damgalamak” olan “branding” kelimesine rastlanmaktadır. Dilimize İtalyanca “marca” kelimesinden geçen “mark”, Türk Dil Kurumu Sözlüğünde bir ticari malı, herhangi bir nesneyi tanıtmaya, benzerinden ayırmaya yarayan özel ad veya işaret olarak tanımlanmaktadır (TDK, 2024).

Marka, üretici veya satıcıların malını tanıtan, onu başkalarının mallarından ayırmaya yarayan isim, terim, sembol, şekil veya bunların bileşimidir (Mucuk, 2012). Bir başka tanıma göre marka, “müşteri ve tüketicilerden gelen, onların imgelerinde algılanan duygusal ve işlevsel getirilere dayanan, ayrıcalıklı bir konum yaratan tüm izlenimlerin içselleştirilmiş bir özetidir” (Knapp, 2003.)

Markanın ilke olarak bir teşebbüsün mal veya hizmetlerini diğer teşebbüslerin mal veya hizmetlerinden ayırt edilmesini sağlayan bir işaret veya işaretler grubu olduğu ve her türlü eşyadan oluşabileceği söylenebilmektedir. Ancak iş(hizmet), sicilde görünmesi şartıyla, işaretlenir. Bu durumda bir markanın, içinde bulunduğu ürün veya hizmetlerin muadillerinden öne çıkmasına ve diğerlerinden farkını göstermesine yardımcı olduğu belirtilebilir. Nitekim kelimeler, logolar, sayılar, şekiller veya bunların kombinasyonları şeklinde oluşturulan markalar bu ürüne kimlik kazandırarak diğerlerinden farkını ortaya koymakta ve bu sayede ayırt edilmesini sağlamaktadır (Güneş, 2018).

Türkiye'nin 1995 yılında Dünya Ticaret Örgütü Kurulu Anlaşması ve eki Ticaretle Bağlantılı Fikri Mülkiyet Hakları Anlaşmasına taraf olması, AB ile Gümrük Birliği anlaşması yapılması ve Avrupa Birliğinde sınai mülkiyet alanında çeşitli düzenlemelerin ve Topluluk mevzuatının üye ülkelerle bağdaştırılması adımlarının atılması gibi gelişmeler Türkiye'de de sınai mülkiyet haklarının uluslararası standartlarda ve etkin bir biçimde korunması zorunluluğunu beraberinde getirmiştir. Türk patent ve Marka Kurumu sorumlu tek kurum olarak uluslararası alanda markalaşma sürecini yönetmektedir.

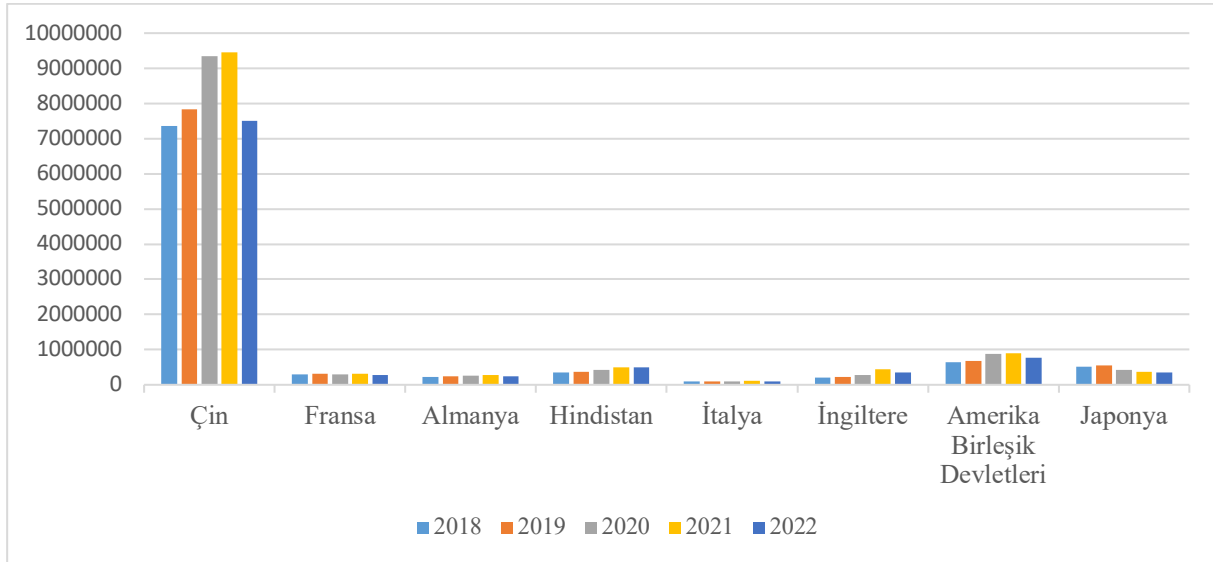
Dünya genelinde ise bu süreçler Wipo (World Intellectual Property Organization)(Dünya Fikri Mülkiyet Ofisi) tarafından yönetilmektedir. Türkiye de Wipo ile anlaşma sağlamış üye ülkelerdendir. İstatistiklere göre Türkiye toplam başvurularda 18. Sırada yer almaktadır. (WIPO,2024).



Grafik 1: 2018-2023 Marka Başvuru Sayıları

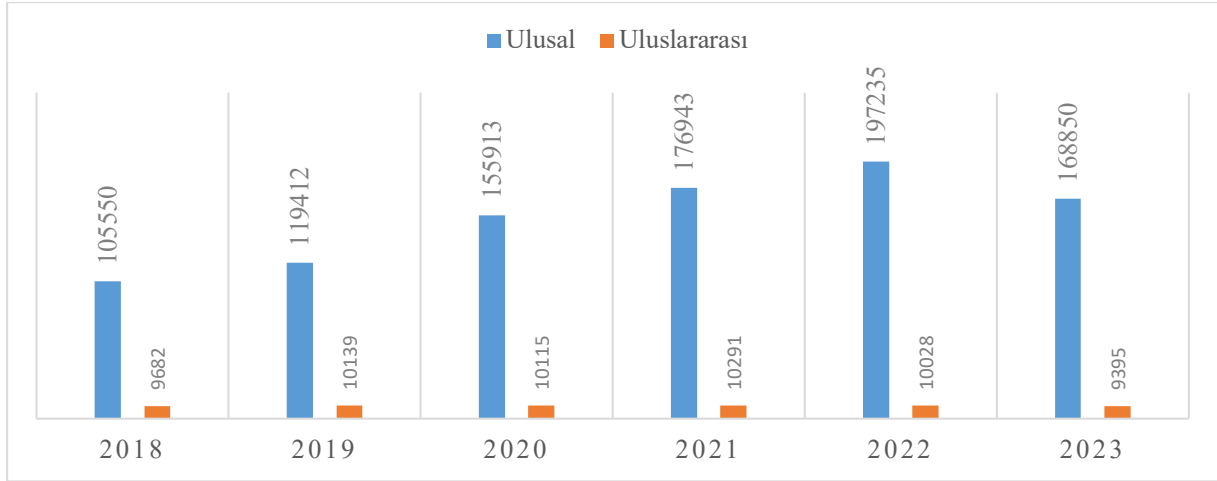
Kaynak: WIPO,2024

Aşağıdaki Grafik 2 de Wipo (World Intellectual Property Organization)(Dünya Fikri Mülkiyet Ofisi) İstatistik veri merkezinin açıklamış olduğu 2018-2023 yılları arasındaki başvuru sayıları görülmektedir. Başvuru sayılarının yıllar itibariyle sürekli artış gösterdiği ortadadır. Fransa, Almanya, Hindistan, İngiltere ve Japonya'nın başvuru sayılarının ortalama olarak birbirine çok yakın olduğu İtalya'nın ise bu ortalamanın çok altında olduğu rakamlardan anlaşılmaktadır. Bununla birlikte Çin'in başvuru sayılarının tüm ülkelere oranla neredeyse 10 kat fazla olduğu, ekonomik ve teknolojik olarak gelişimlerin sonucunda başvuru sayılarındaki artışın ortaya çıktığı söylenebilir.



Grafik 2: Ülkelere ve Yıllara Göre Marka Başvuru Sayıları (2018-2022)

Kaynak: WIPO,2024



Grafik 3: Türkiye’de Ulusal ve Uluslararası Marka Başvuru Sayıları
Kaynak: WIPO,2024

2. Markanın Belirleyicileri

Markanın belirleyicilerini marka değeri, marka kimliği, marka konumlandırması ve marka imajının yaratılması şeklinde belirtilebilmektedir. Marka değeri, bir işletmenin piyasadaki gücünün ve itibarının somut bir göstergesidir. Yüksek marka değeri tüketicilerin gözünde güven ve kaliteyi temsil eder. Dolayısıyla satışları ve müşteri sadakatini artırır. Bu değeri arttırmak ve daimî kılmak, rekabet avantajı elde etmek ve ilgili pazarda uzun süreli bir varlık göstermek için ana unsurdur. Bir pazar bölümünde bulunan ve marka değeri yüksek bir firmayla rekabet etmek oldukça zor bir iştir (Aaker, 1991: 29). Güçlü bir marka aynı zamanda şiddetli fiyat rekabetine ve diğer rekabetçi pazarlama uygulamalarına karşı firmayı bir miktar savunur (Armstrong ve Kotler, 2017: 223).

Markanın karakterini, değerlerini ve dışavurumunu şekillendiren şey markanın kimliğidir. Görsel ve dilsel bir kimlik yaratmak, kullanılan renklerden logoya reklam mesajlarından müşteri iletişimine kadar her detay bu kimliğe tabidir. Bu kimlik tüketicilerin markayı kolayca tanınması ve hatırlaması için çok önemlidir. Aynı ürünün markalı versiyonu için markalı olmayan versiyonuna göre tüketiciler daha olumlu tepki veriyorsa bu markanın, olumlu yönde müşteri temelli marka değeri vardır. Aynı durumlar altında tüketiciler daha az olumlu tepki veriyorsa bu markanın olumsuz yönde müşteri temelli marka değeri vardır (Kotler ve Keller, 2016: 147) Hedef kitleyi anlamak, pazar trendlerini izlemek ve rekabetçi bir ortamda markanın kimliğini ve konumunu belirlemek elzemdir. Marka stratejilerinin ve marka konumunun belirlenmesi için; tüketici davranışları, ihtiyaçları ve tercihleri üzerine detaylı bilgi toplamak ve analiz etmek gerekmektedir.

Marka konumlandırması da hedef kitle de belirli bir algı yaratma çabasıdır. Bu, tüketicilerin markayı rakiplerinden ayırt etmesini sağlar ve markanın piyasadaki özgün yerini belirler. Etkili bir konumlandırma, net bir değer önerisi ve tüketicilere hitap eden benzersiz özellikler gerektirir.

Marka imajının yaratılması, tüketicilerin zihninde markaya bağlı olarak içselleştirilmiş bir görüntünün ve ilişkiler ağının oluşturulmasıdır. İçsel imaj, somut, görsel ve neredeyse hissedilebilir niteliktedir ve bu açıdan sözel bilgidan daha değişik bir zihinsel kodlamaya dayanır. İçsel imajların, sözsel mesajlardan daha etkili olmasının nedeni, bunların insan beyninde ne şekilde saklandıklarıyla doğrudan ilişkilidir; çünkü içsel imajlar gerçek görüntüler gibi yoğun bir şekilde hissedilebilirler (Ruge, 1999).

3. Marka Türleri

Ticaret markası, hizmet markası, garanti markası ve ortak marka olmak üzere dört ayrı marka türü bulunmaktadır. Bunlar ticaret markası, hizmet markası, garanti markası ve ortak marka şeklindedir.

3.1. Ticaret Markası

Markalar amaçlarına göre belirledikleri mal ve hizmetler bakımından ikiye ayrılır. Marka başvurularında mal ve hizmetlerin sınıflandırılmasına ilişkin tebliğe göre, ürün sınıfları 34, hizmet sınıfları 11 gruptan oluşur. En genel anlamıyla marka, malları hangi şirketin ürettiğini veya pazarladığını gösteren bir işaret olarak tanımlanabilir. İşaret, ortaya çıkan ilk işaret türüdür ve bu işaret ilk yasal korumayı bu şekilde almıştır. Günlük hayatımızda karşımıza çıkan markaların çoğu tescilli markalardır ve bunlara örnek olarak “Casper®”, “Beymen®”, “Nivea®”, “Puma®” verilebilir (Karabulut, 2008).

3.2. Hizmet Markası

Hizmet markası, bir şirketin sunduğu hizmeti diğer şirketlerin hizmetlerinden ayıran ve farkını vurgulayan işarettir. Böylece hizmetin sahibini gösterirler. Hizmet markasının konusu maddi olmayan ekonomik değerlerdir. Hizmet sektörünün gelişmesi ve yaygınlaşması ve bu alanda artan rekabet göz önüne alındığında, marka imajı bankacılık, sigortacılık, turizm, finans, yatırım ve benzeri diğer hizmetleri veren şirketlerin hizmetlerini ayırt etmek için çok önemlidir. Hizmet markalarına örnek olarak “AnadoluJet®”, “Akbank®”, “Jolly Tur®” verilebilir (Demirci, 2019).

3.3. Garanti Markası

Markaları sahiplerine göre sınıflandırarak, birçok firma tarafından kullanılan, üretim yöntemini, kaliteyi, kullanılan malzeme ve teknikleri, standartlara uygunluğu ve coğrafi menşei garanti eden garanti markaları bulunmaktadır (Demirci, 2019). Bu nedenle, bazı durumlarda garanti işaretleri, markayı kullanan şirketlerin ortak özelliklerini garanti eder: Üretim süreci, bazı durumlarda ise malların coğrafi kökenini ve kalitesini garanti eder.

Garanti işareti eğitimde “kalite işareti”, “test işareti” veya “denetim işareti” olarak da adlandırılır (Karataş,2017). Marka sahibine tasarruf hakkı veren garanti markası, marka sahibinin ürün veya hizmetlerinde veya ekonomik olarak ona bağımlı olan şirkette kullanılamaz (Bozgeyik,2013).

Garanti markaları genellikle ulusal veya uluslararası endüstriyel standart veya belgelendirme kuruluşları tarafından tescil edilerek kullanım şartlarını karşılayan işletmelere kullanılmaktadır. Tanımda geçen “marka sahibinin kontrolü altında” ifadesi ile garanti markasının çeşitli işletmeler tarafından kullanılmasının marka sahibinin kontrolü altında gerçekleştiği ifade edilmektedir. (Bozgeyik,2013).

Standartlar, dünya çapında veya bölgesel nitelikte birçok kuruluş tarafından belirlenmekte, yayınlanmakta, belgelendirilmekte ve yönetilmektedir. Bunlardan ISO (International Standards Organization (Uluslararası Standartlar Örgütü)), ITU (International Telecommunications Union (Uluslararası Telekomünikasyon Birliği)), IEEE(Institute of Electrical and Electronics Engineers (Elektrik ve Elektronik Mühendisleri Birliği)), ANSI (American National Standard Institute (Amerikan Ulusal

Standartlar Enstitüsü)), DIN (Deutsches Institut für Normung (Alman Standardizasyon Enstitüsü)), CENELEC (The European Committee for Electrotechnical Standardization (Avrupa Elektroteknik Standardizasyon Komitesi)) ve TSE (Türk Standartları Enstitüsü) en çok bilinenlerdir. (Bozgeyik,2013)

Kontrol olgusu, işletme sahibine garanti markasını kullanma yetkisi tanınması ile başlamakta ve kullanımın ilgili teknik yönetmeliğe göre gerçekleşmesi konusunda garanti markası sahibinin sahip olduğu yetkileri ifade etmektedir. Kontrolün kapsamı, garanti markasının ilişkin olduğu mal ve hizmetlerin ilgili teknik yönetmelikte belirlenen nitelikleri taşıyıp taşımadığını belirleme amacı çerçevesinde değişebilmektedir (Karahan,2006).

Garanti markası doğrudan mal ve hizmetlerin ayırt edilmesi işlevi görmemekte, bu nedenle farklı mal ve hizmet markaları ile birlikte kullanılmakta ve bu markaların tanınmasında, tutulmasında ve ayırt edicilik özelliğinin güçlenmesinde etkili olmaktadır.

Sahip olduğu işlev farklılığından başka, garanti markasının emtia markalarından temel farkı, marka sahibinin mal ve hizmetleri ile bu kimseye iktisaden bağlı olan işletmelerin mal veya hizmetlerinde kullanılamamasıdır. Bunun nedeni, garanti markasının ilgili teknik yönetmeliğe uygun olarak kullanılıp kullanılmadığı konusunda marka sahibinin bu markayı kullananlar karşısında tarafsız olmasını gerektiren yetkilere sahip olmasıdır (Karahan, 2004).

3.4. Ortak Marka

Ortak marka, üretim veya ticaret ya da hizmet işletmelerinden oluşan bir grup tarafından kullanılan işarettir. (Smk 6769 mad:31/3) Kişi veya kuruluşların tek başına veya iş birliği içinde kullandıkları markaya bireysel marka adı verilirken, kişi veya kuruluşların grup olarak başka bir tüzel kişilik oluşturmaksızın, yaptıkları sözleşmeye uygun olarak sahip oldukları ve kullandıkları markalara ortak marka adı verilmektedir.

Ortak işaret gruba değil, gruba dahil olan bireylere aittir. Bu grubun üyesi olan herkes, markanın tamamı üzerinde haklara sahip olduğu için, markayı tek başına kullanabilir (Karasu, 2021). Marka tescil başvurusu ile birlikte TÜRKPATENT’e, ilgili şirketlerin ve bu şirketlerin oluşturduğu topluluğun üyelik şartlarını, markanın kullanım şartlarını ve isteğe bağlı olarak yaptırımlarını belirleyen teknik şartnamenin sunulması gerekmektedir (Tekinalp, 2012). Ülkemizde “TARİŞ” markası, Ege bölgesinde incir, üzüm, pamuk, yağlı tohumlar ve ürünlerini üreten ortak bir birlik markası olarak ürünlerinde yer almaktadır. Yine ülkemizde yaygın olarak kullanılan markalara örnek olarak “Marmarabirlik” ve “Fiskobirlik” verilebilir (Kayıhan, 2021).

4. Marka Yönetimi

Markanın etkin bir şekilde yönetilmesi, işletmelerin başarısında kritik bir rol oynar. Marka değeri tüketicilerin bir ürünü ya da hizmeti tercih etme sebepleri arasında önemli yer tutmaktadır. Bu değeri yaratma ve korumak için marka kimliği oluşturma, pazar araştırması, marka konumlandırması, müşteri ilişkileri, reklam ve promosyon teknikleri ile kriz yönetimi ve itibar koruma gibi bir çok stratejik yolun izlenmesi gerekmektedir. Marka kimliği, marka stratejilerinin anlamlandırılmasını sağlar ve yaratılmak istenen marka çağrışımlarının toplamını ifade eder. Marka kimliği kullanıcı ve marka arasında bir ilişki

kurulmasına yardım eder (Aaker, D.A. 1996). Doğru yönetilen bu hamleler markanın piyasadaki durumunu güçlendirmeye ve hedef kitle ile iletişimini derinleştirmeye yardımcı olmaktadır.

Müşteri ilişkilerinin güçlendirilmesi ve sadakatın artırılması marka yönetiminin temel taşlarından biridir. Müşterilere değer verildiğini hissettirmek, onlarla sürekli ve anlamlı bir iletişim kurmak, olumlu deneyimler sunmak marka sadakatini ve haliyle uzun vadeli başarıyı sağlar.

Etkili reklam ve promosyon çalışmaları da marka bilinirliğini artırır ve kitle üzerinde kalıcı bir izlenim bırakır. Yaratıcı ve yenilikçi kampanyalar, sosyal medya stratejileri ve hedef kitleye özel promosyonlar markanın görünürlüğünü ve pazardaki etkisini güçlendirir. İşletmeler marka imajlarını güçlendirmek için, görsel ve yazılı basın reklamlarında kullanarak markanın hatırlanmasına yardımcı olan renk, tasarım, mimari stil, maskot, logo gibi öğelerden yararlanır. Bu gibi unsurlar hatırlamayı tetikleyerek bireyleri satın almaya sevk eder ya da bireylerin zihnindeki marka imajını güçlendirir (Kapferer, 1992).

Yukarıda sayılan etken ve adımlar dışında hayati öneme sahip olan bir adım da markanın itibarını korumaktır. Kriz anlarında hızlı ve etkili bir şekilde hareket etmek, kriz yönetimi planlarını hazırlamak, olası riskleri önceden belirlemek ve kriz durumunda şeffaf doğru bilgi ile halkla ilişkileri yönetmek markanın uzun vadeli itibarını sürdürmenin en etkili yöntemidir.

5. Markanın Fonksiyonları

Piyasadaki serbest rekabet ortamının en önemli araçlarından biri olan markanın farklılaşma, mal ve hizmetlerin menşe ispatı, reklam ve garanti işlevi olmak üzere 4 temel işlevi vardır.

5.1. Ayırt Etme Fonksiyonu

Herhangi bir işaretin yetkili sicile tescili için en önemli unsur, onu diğerlerinden farklılaştıran özelliğidir. Mal veya hizmetleri birbirinden ayırmaya yarayan markanın ayırt edici işlevidir. Hedef kitle nezdinde bu markanın benzer markalardan ayırt edilmesi, marka sahibinin işletmesi ve mal veya hizmetleri denilince akla gelen ve dolayısıyla işletmeyi karakteristik olarak andıran ilk şeyin, bir markanın ayırt edici işlevini yerine getiriyor olmasıdır. Markanın ayırt edici işlevi sayesinde tüketici, bu markanın mal ve hizmetlerini piyasada karışıklık yaratmadan diğer markalardan kolaylıkla ayırt edebilmektedir (Kaya vd. 2020).

5.2. Menşei Gösterme Fonksiyonu

Menşei gösterme fonksiyonu mal veya hizmetlerin menşei, yani kaynağını, malı üreten, piyasaya arz eden veya hizmeti sağlayan şirketi belirtmektedir. Ticari isim doğrudan bir ürünün üreticisine veya hizmet sağlayıcısına atıfta bulunurken, markanın menşei gösterme işlevi dolaylıdır. Bu bağlamda tüketicinin, benzer markalı malların, özellikle bilinmese bile bilinebilecek bir teşebbüse ait olduğuna inanması yeterlidir (Karasu, 2021).

Yukarıda da bahsedildiği gibi, tarihsel marka gelişim sürecinde, markanın yaratılmasında malın veya hizmetin nereden geldiğini ve kimin yaptığını duyurma isteği ön plana çıkmış ve bu nedenle markalaşma doğmuştur. Ancak günümüzde bu işlevin hem marka lisans sözleşmelerinde hem de franchise sözleşmelerinde önemini kaybettiğini görülmektedir. (Çolak, 2012).

5.3. Reklam Fonksiyonu

Reklamın temel amacı, hedef kitleyi etkilemektir. Bu nedenle marka seçimi yapılırken hedef kitlenin dikkatine etkisi, duyuşal hafızası ve reklam kapasitesi gibi kriterler dikkate alınmaktadır. Mal veya

hizmetlerin reklam yoluyla tüketiciye tanıtımı yapılabileceğinden, reklam işlevi büyük önem taşımaktadır. Hedef kitle, reklamla birlikte markadan etkilenir ve bu ürünü satın almak veya hizmete erişmek ister. Markanın hedef kitleye ulaşma işlevini yerine getirir (Yaman, 2019).

5.4. Garanti Fonksiyonu

Tanınmış markanın garanti fonksiyonu, hem alıcılar için, hem de işletmeler için önemli yararları içinde barındırmaktadır. Alıcılar için ürünün kalite ve diğer özellikleri konusunda güvence sağlamak ve satın alma karar sürecini kısaltmakta iken işletmeler açısından ise bu güvencelerle hareket eden alıcılar, işletmenin ürünlerini tekrar satın almakta ve hatta işletmenin markasını taşıyan diğer ürünleri de satın alma yoluna gidebilmektedir. Dolayısıyla tanınmış markanın garanti işlevi sonucunda, alıcılar ve işletmeler açısından bir “kazan-kazan” durumu oluşmakta ve belirli şartların tekrar etmesi şartıyla bu durum süreklilik göstermekte, alıcılar ile tanınmış marka arasında sıkı bir bağ ortaya çıkmaktadır (Çınar ve Sağlık, 2006).

Tüketici belirli bir markanın ürün veya hizmetini satın alırken, ürünün hangi firma tarafından üretildiğini veya firmanın hangi sektörlerde ürün ürettiğini ya da hangi hizmetleri sunduğunu bilmeyebilmektedir. Bu bilgilere hâkim olmak yerine bu markanın ürünlerini daha önce kullanmış olmayı markanın hizmetlerinden faydalanmış olmaya tercih etmektedir. Daha önceki tecrübelerinden öğrendiği kaliteyi her zaman bulacağına inanmış olan tüketici bir marka için en iyi veri olarak değerlendirilmektedir.

Markanın garanti ve güven işlevi, tüketicinin deneyiminin bir sonucu olduğu için önemlidir. (Bozgeyik, 2018). Tanındığı ve güvendiği markanın mallarını satın almayı ve hizmetlerinden yararlanmayı tercih eden tüketici, tatsız sürprizlerle karşılaşma riskinden kaçınmaya yönelir. Garanti işlevi, bir şirket başka bir üründe belirli bir ürün için güvendiği ve hedef kitle tarafından bilinen markayı kullandığında da korunur. Örneğin tüketici, cep telefonu almak için bir teknoloji mağazasına gittiğinde, daha önce tv markası olarak tanıdığı “A” markasının telefonlarının da kaliteli olacağını düşünmektedir. Daha önceki deneyimlerinden kaynaklanan güven duygusuyla sorunsuz kullandığı ve çok memnun kaldığı “A” TV markasından kazandığı öngörü ile aynı markanın telefonunu satın almaktadır. Böylelikle tüketicinin tutumundan da anlaşılacağı üzere, marka garanti işlevini yerine getirmiş olmaktadır. Ancak, markanın garanti işlevinin marka hukuku kapsamında herhangi bir koruma altına alınmadığının bilinmesi gerekmektedir. Tek yaptırımın ekonomik zarara uğrayan tüketicinin artık bu markanın ürünlerini tercih etmemesi sonucudur. Aksi takdirde, markaya ait ürünlerin firma tarafından sonradan kalite düşüşü ile piyasaya sürülmesi durumunda ilgili markaya herhangi bir yaptırım uygulanmadığı apaçık ortadadır. (Sarıgül, 2022).

6. Literatür

İşletmeler için markalar ulusal ve uluslararası pazarda varlık kazanma ve ticari faaliyetlerin genişletilmesi açısından büyük önem taşımaktadır. Markanın doğru hedef kitleye ulaşması ve bu hedef kitle ile olan ilişkilerin doğru yönetilmesi markanın fonksiyonlarının gerekliliğinin yerine getirilmesine bağlıdır.

Marka ile ilgili Akgün ve Tekin (2019) tarafından Konya' da bulunan kamu ve özel hastanelerde çalışan toplam 242 doktor ve yöneticiye anket uygulanarak yapılan çalışmada kurumsal itibar yönetimi uygulamalarının marka değeri üzerindeki etkisinin araştırılmıştır. Bu çalışma sonucunda özel hastanelerdeki katılımcıların kamu hastaneleri katılımcılarına göre kurumsal itibar yönetim ile ilgili faaliyetlerinin marka değeri üzerinde daha fazla etkili olduğu anlaşılmıştır.

Aslan ve Özbeyaz'ın (2019) çalışmasında ise tüketicilerin satın alma sürecinde markanın etkisi ölçülmüştür. Çalışmanın uygulama bölümü Adıyaman Üniversitesi öğrencilerinden 379' una anket uygulanarak gerçekleştirilmiştir. Analiz sonuçlarına göre diğer ürün kategorilerinin ortalama kullanım ve tercih oranının akıllı telefonda daha düşük olduğu ifade edilmiştir. Ayrıca diğer ürün kategorilerinde tercih edilen ve kullanılan markalar arasında oransal olarak önemli farklılıklar tespit edilmiştir. Satın almada marka ve fiyat etkisinin cinsiyet değişkenine göre anlamlı bir farklılık tespit edilmemiştir.

Atılğan (2019) ise çalışmasında bisküvi ve gofret sektöründe marka kişiliğinin satın alma davranışları üzerindeki etkisini incelemeyi hedeflemiştir. Çalışmanın uygulaması Türkiye' deki bir devlet üniversitesindeki 2856 öğrenciye anket yöntemi kullanılarak oluşturulmuştur. Çalışmada öğrencilerin; marka tercihlerinde lider, başarılı, naziklik gibi özellikleri önemsedikleri belirtilmiştir.

Balıkçıoğlu ve Kıyak'ın (2019) yaptığı literatür taramasında incelemesi ve karşılaştırılması zor olan marka nefreti üzerinde durulmuştur. Çalışma Hatay'ın Antakya İlçesinde akıllı cep telefonu markalarına karşı marka nefreti olan tüketicilere kartopu örneklem tekniği kullanılarak yapılmıştır. Çalışma sonucuna göre sembolik uyumsuzluk ve ideolojik uyumsuzluğun marka nefretini pozitif yönde ve anlamlı bir şekilde etkilediği ortaya çıkmıştır. Tüketicilerden marka nefreti olanların markadan kaçındığı ve olumsuz bir şekilde sözlü olarak diğer tüketicileri de etkilediği belirtilmiştir.

Elagöz ve Yücekaya (2019) ise tüketici temelli marka değerinin ağızdan ağıza iletişim olayı üzerindeki etkisini ölçmektedir. Çalışma 2019 yılı Şubat-Nisan aylarını kapsayan dönemde Ankara, Tekirdağ ve Çanakkale illerinde 453 üniversite öğrencisine anket yöntemi uygulanarak oluşturulmuştur. Çalışma sonucuna göre ağızdan ağıza iletişimin, tüketici temelli marka değerini pozitif yönde etkilediği tespit edilmiştir.

Koçak ve Bayraktar ise (2019) marka kökenini tanıma seviyesini yardımsız olarak test edilmesini amaçlamışlardır. Bu çalışmada, Mısırlı 840 tüketiciye, Mısır'da faaliyet gösteren 12 Türk markasının menşelerini doğru tanıma testi yapılmıştır. Araştırma sonucunda katılımcılar tarafından Ülker, İstikbal ve Paşabahçe'nin en çok bilinen markalar olduğu sonucuna ulaşılmıştır.

Sargın ve Koçer'in (2020) bir jeans markasına yönelik marka kişiliği algılarının benlik saygısı üzerindeki etkisini ve marka kişiliği algıları ve benlik saygısı düzeylerinin satın alma tarzları üzerindeki etkisini araştıran çalışma ise Kayseri Nuh Naci Yazgan Üniversitesi'nde öğrenim gören 375 lisans öğrencisine yüz yüze anket yöntemi uygulanarak gerçekleştirilmiştir. Araştırmanın bulgularına göre, tüketicilerin marka kişiliği algılarının benlik saygıları ve satın alma tarzı üzerinde anlamlı bir etkisinin olduğu belirlenmiş ve benlik saygısının tüketicilerin satın alma tarzı üzerinde anlamlı bir etkisinin olmadığı belirtilmiştir.

Bir diğer çalışma ise Öcel (2019) tarafından yapılmıştır. Çalışmada 1995 ve sonrasındaki 23 yıl içerisinde Türkiye'deki üniversitelerde marka alanında yazılmış doktora tezleri taranmıştır. Bu taramada marka konulu tezlerin yayımlanma yılı, yayım dili, tezlerde kullanılan araştırma yöntemleri gibi birçok konu başlığı altında 221 doktora tezi bibliyometrik analiz yöntemi ile detaylı olarak incelenmiştir. Yapılan analiz sonucunda en çok marka değeri konusunun incelendiği ve nicel araştırma yönteminin de en fazla tercih edildiği belirtilmiştir.

Yıldız ve Günaydın (2019) ise marka güven, marka çağrışımları, marka farkındalığı, marka imajı bulunmaktadır. Bu değişkenlerin algılanan kalitenin marka aşkı üzerindeki etkileri araştırılmıştır. Çalışmada 2018 yılı içinde satış miktarı açısından fazla müşteri kitlesine sahip olan akıllı telefon kullanıcılarından 400 kullanıcıya anket uygulanmıştır. Analizler sonucunda bahsedilen marka unsurlarının (marka güveni, marka imajı vb.) marka aşkı üzerinde anlamlı ve pozitif bir etkisi olduğu anlaşılmıştır.

İncelenen literatür taramasında çalışmaların büyük çoğunluğunun nicel araştırma yöntemleri uygulanarak yapıldığı ve bu çalışmalar çerçevesinde markanın farklı değişkenler üzerindeki etkisinin ölçüldüğü anlaşılmaktadır.

7. Araştırmanın Amacı, Kapsamı, Yöntemi

Bu çalışmanın amacı; Türkiye’de bilinen tescilli bir markanın yaşadığı sorunun garanti ve menşei fonksiyonun çerçevesinde incelenmesi ve aynı zamanda uluslararası boyutuna ilişkin öneriler getirilmeye çalışılmasıdır. Ayrıca çalışmada, marka tescili, garanti fonksiyonu ve menşei fonksiyonundan yararlanılarak sosyal medya da pazarlama etkilerinin negatif yansımaları ele alınmış, yakın zamanda sosyal medya da negatif bir deneyim yaşamış “x” firmasının yaşadığı pazarlama sorunları incelenmiştir.

7.1. Araştırma Yöntemi

Araştırmada nitel araştırma yöntemlerinden biri olan doküman incelemesi yöntemi kullanılmıştır. Nitel araştırma; belli bir nokta üzerinde odaklanmada çok metotlu araştırma problemine yorumlamacı yaklaşım benimseyen yöntemdir (Denzin ve Lincoln, 2018). Belgesel tarama olarak da bilinen döküman analizinde, var olan kayıt ve belgeler incelenerek veri elde edilmektedir. Döküman analizi, belli bir amaca dönük olarak kaynakları bulma, okuma, not alma ve değerlendirme işlemlerini kapsamaktadır (Karasar, 2005). Bir başka ifadeyle doküman analizi, basılı ve elektronik (bilgisayar tabanlı ve internet erişimli) materyallerin incelenmesi ve değerlendirilmesi sürecinde gerçekleşen bir dizi işlemdir (Bowen, 2009). Bu süreç ayrıca, araştırılması hedeflenen olgu ya da olgular hakkında bilgi içeren yazılı materyallerin incelenmesi olarak da tanımlanmaktadır (Yıldırım & Şimşek, 2013). Aynı zamanda resmi ya da özel kayıtların toplanması, sistematik olarak incelenmesi ve değerlendirilmesidir (Ekiz, 2015). Diğer bir tanıma göre ise doküman analizi, birincil araştırma verileri kaynağı olarak çeşitli yazılı metin biçimlerini toplamak, gözden geçirmek, sorgulamak ve analiz etmektir (O’Leary, 2017).

Kısacası, araştırma konusu hakkında diğer kişi ya da kurumlar tarafından yazılmış, hazırlanmış ya da yaratılmış çeşitli yazı, belge, yapım veya kalıntının toplanması ve incelenmesi doküman analizi olarak kabul edilmektedir (Seyidoğlu, 2016).

Marka tescilinin uluslararası ticaretteki yerinin menşei ve garanti fonksiyonu açısından incelenmesi üzerine yapılan bir alan çalışması olan bu çalışmada bir örnek olay incelemesi üzerinden gidilmiştir. Örnek olay incelemesi Türkiye’deki gıda sektöründeki markalar evreninden “X” markası örnekleme üzerinden belirtilmiştir. İlgili firma ürünlerine Türkiye’deki birçok zincir market raflarından ulaşılabilir. Marka başvuruları ulusal başvuru olduğu halde ürün paketleri üzerinde kullandığı ibare yurt dışı markasıymış izlenimini verdiği düşünülmektedir.

“X” firmasının Türk Patent ve Marka Kurumu kayıtlarında 2004 yılından itibaren yapmış olduğu 97 başvurunun yer aldığı görülmektedir. (Türk Patent ve Marka Kurumu 2024)¹ Bu başvurulardan 66 adedi tescillidir. Marka başvurularının yurt dışı menşei değil ulusal bir firma olduğu sahiplik bilgisinden anlaşılmaktadır. Uluslararası hiçbir marka tescili olmayan firma ocak ayı itibarıyla bir markası için uluslararası başvuru yapmış ancak başvuru henüz tescil kararı ile sonuçlanmamıştır. Yaşanan olumsuz olaydan dolayı markaya açılmış herhangi bir dava bilgisi olmadığı gibi Türk Patent ve Marka Kurumu

¹ <https://www.turkpatent.gov.tr/arastirma-yap?form=trademark>

siciline yansıyan herhangi olumsuz bir durum da bulunmamaktadır. Dolayısıyla elde edilen bu veriler ışığında “X markasının kurum kimliği çalışmaları sosyal medya verileri, müşteri ilişkileri, geri dönüşlere verilen cevaplar ve müşteri davranışlarının markaya olan yansımalarına bağlı olarak markanın garanti ve menşei fonksiyonu değerlendirilmeye çalışılmıştır.

7.2.Verilerin Toplanması

Çalışma iki bölümden oluşmaktadır. Birinci bölüm, marka kavramı, marka türleri ve marka yönetimi ile marka fonksiyonlarından oluşurken, İkinci bölüm ise, tanınmış markanın garanti fonksiyonunu yerine getirmeyen bir yerel firmanın yaşadığı negatif bir olayın pazarlama sırasında yaşadığı deneyimler ve bunun sonuçları analiz edilmesidir. Araştırmanın veri kaynağı, TÜRKPATENT’in ve WIPO’nun başvuru verileri ile yaşanan sosyal medyada yaşanan olayın verileridir.

8.Bir Çikolata Firması, Sosyal Medya ve Marka Yönetimi Hataları

Marka yönetimi, bir markanın itibarını, değerini, tanınmışlığını ve müşteri sadakatini artırmak ve genişletmek için yapılan stratejik plan, program ve faaliyetlerin toplamıdır. Yönetim süreci markanın kimliğini oluşturmayı, pazarda konumlandırmayı ve hedef kitle ile etkin bir şekilde iletişim kurmayı içerir. Marka değeri ürün karmasının genişletilmesinde başarılı bir şekilde rol alabilir. (Armstrong ve Kotler, 2017: 223; Aaker, 1991: 29).

Sosyal medya, O'Reilly Media tarafından 2004’te kullanılmaya başlayan ve ikinci nesil internet hizmetlerini yani internet kullanıcılarının ortaklaşa ve paylaşarak yarattığı sistemi tanımlayan web 2.0 kavramının, kullanıcı hizmetine sunulmasıyla birlikte; tek yönlü bilgi paylaşımından, çift taraflı ve eş zamanlı bilgi paylaşımına ulaşılmasını sağlayan medya sistemidir.

Bilgi teknolojileri ve internet tabanlı teknolojiler aracılığıyla, marka yönetimiyle ilgili faaliyetlerin bir kısmının veya hepsinin elektronik ortamda gerçekleştirilmesi veya desteklenmesiyle ortaya çıkan e-marka yönetimini; yeni ekonomi bakış açısıyla, yeni iş yönetimlerine göre ve teknoloji bakış açısıyla tanımlamamız mümkündür. Yeni ekonomi bakış açısıyla e-marka yönetimi, şirketlerin rekabet avantajı sağlaması için önemli bir araçtır. Yeni iş yönetimlerine göre e-marka yönetimi ise, müşteri odaklı bir marka yönetim felsefesidir ve son olarak teknoloji bakış açısıyla e-marka yönetimi, günümüz teknolojisinin daha etkin ve verimli iş sonuçları almak için işletme faaliyetleriyle bütünleştirilmesidir (Büyüközkan, 2005: 195.)

8.1. X Markası ve Marka Yönetimi

Marka yönetimi aşamasının en önemli basamaklarından biri olan marka iletişimi; markanın mesajlarını hedef kitleye iletmek için kullanılan tüm yöntemleri kapsar. Bunlar reklam, halkla ilişkiler sosyal medya etkinlikler ve diğer tüm iletişim kanallarını içermektedir. Doğru, tutarlı ve etkili bir marka iletişimi markanın mesajının doğru şekilde anlaşılmasını sağlamaktadır. Bununla birlikte kriz yönetimi de çok önemlidir. Kriz anlarında hızlı ve etkili bir şekilde hareket etmek, kriz yönetimi planları hazırlamak, olası riskleri önceden belirlemek ve kriz durumunda şeffaf doğru bilgi ile halkla ilişkileri yönetmek markanın uzun vadeli itibarının sürmesinde en etkili yöntemidir.

Son dönemlerde fazlaca duyulan ve paylaşılan durum ise markanın etkin bir şekilde yönetilemeyeceğine dair sosyal medyada meydana gelen gelişmelerdir. Tüketicinin “x” çikolata markasından aldığı bir ürün deneyimi sonrasında bir sosyal medya platformunda “*Bir heves aldığım kahve eşlikçilerime bakın, küflenmiş çikolataya ilk defa şahit oluyorum üstelik son tüketim tarihine de daha var. Muhtemelen tedarik zinciri sürecinde muhafaza koşullarında bir problem var.*” mesajı ile birlikte küflü çikolata fotoğrafları paylaşılmıştır. Bu paylaşımdan sonra ilgili çikolata firmasının üst düzey bir yöneticinin yazdığı tehditkâr ve tüketiciyi suçlayıcı mesaj markanın nasıl yönetilemeyeceğini açıkça ortaya koymuştur. Kullanıcının bahsettiği sorun gıda kategorisinde çıkabilecek operasyonel süreçlerden kaynaklanabilmektedir kaldı ki tüketici “*tedarik zinciri sürecinde muhafaza koşullarında bir problem var*” diyerek bunun kabul edilebilir gibi gördüğünün sinyali vermiştir.

Burada yapılması gereken tüketici ile onunla ilgilenildiği açıkça ifade eden bir geri dönüş yapmak, üründe meydana gelen aksaklık yahut soruna sahip çıkıldığını ortaya koyan bir iletişim kurmaktır. Bu beklenti marka yönetim stratejisinin; marka kimliğinin belirlenmesi, Müşteri ilişkilerinin güçlendirilmesi, sadakatin artırılması ve kriz yönetimi başlıklarının gereğinin yapılmasıdır. Hiçbir geri dönüş yapılmayarak sessiz kalınması da pozitif olmadığı gibi negatifte olmayan sonuçlar doğuracak bir duruş olarak değerlendirilmektedir.

Yaşanan olayda marka yönetim stratejilerinin birçok unsurunun etkili ve verimli kullanılmadığı ortaya çıkmıştır. Marka değerleri ve prensipleri, davranışsal analiz kapsamında müşterilerin satın alma alışkanlıkları, marka ile etkileşimleri ve bunların geri dönüşleri; iletişim stratejisi kapsamında tutarlı mesajlaşma ve içerik pazarlaması, müşteri deneyimi yönetimi kapsamında müşteri hizmetleri yönetimleri, müşteri geri bildirimi; ürün ve hizmet kalitesi kapsamında kalite kontrol ve kalitenin takibi çevrim içi varlık yönetimi kapsamında sosyal medya yönetimi öne çıkanlardır.

Yukarıda bahsedilen olaydan sonra çikolata firmasının markaları ivedi bir şekilde çok büyük zincir marketleri raflarından kaldırılmıştır. Birçok sosyal medya platformunda vatandaşlarda tepki mesajları paylaşılmıştır. Öyle ki yaşanan marka krizi spesifik kalmamış firma ile ilgili geçmişe dönük birçok iş ve paylaşım araştırılmış, eleştirilmiştir. Sonuç olarak ilgili marka krizi yönetememesi sebebiyle negatif anılan bir marka olmuş, kriz dönemi ve sonrası olumsuz yorumlarla anılmıştır.

8.1.1. X Markası Özelinde Markanın Ayırt Etme Fonksiyonu

6769 sayılı Sınai Mülkiyet Kanunu’na göre, marka olabilecek işaretlerin ayırt edici (*distinctive*) olması gerektiği hükme bağlanmıştır. Dolayısıyla, bir işaretin marka olarak tescil edilebilme şartlarından olan 6769 sayılı Kanun’un 4 maddesine göre, bir teşebbüsün mallarının veya hizmetlerinin diğer teşebbüslerin mallarından veya hizmetlerinden ayırt edilebilmesidir. Ayırt edicilik esas olarak, farklı işletmeler tarafından üretilen malların veya sunulan hizmetlerin tüketiciler nezdinde ayırt edilebilmesi fonksiyonuna işaret etmektedir. X markasının Türk Patent ve Marka Kurumu nezdinde tescilli markalarının varlığı bilinmektedir.

8.1.2. X Markası Özelinde Markanın Menşei Gösterme Fonksiyonu

Markanın menşei fonksiyonu sayesinde tüketiciler malın veya hizmetin hangi kişi veya kuruluşa ait olduğunu anlayarak bu tespit uyarınca mal ve hizmeti anlayabilecektir. Tüketici markanın kullandığı mal ve hizmetin kaynağını, hangi firma ya da üretici tarafından nerede üretildiği ya da hizmetin nereden sağlandığı bilgisini açık ve net ortaya koymaktadır. X markası bilgilerinde marka menşeinin yerli, başvuruların ulusal olduğu açıkça belli olsa da marka başvurusu sırasında kullandığı isim markanın,

çikolata alanında çok ünlü başka bir ülkede üretilmiş markanın o ülkenin markasıymış sanrısı uyandırmaktır. Buradan da fark edileceği gibi menşei fonksiyonunun uygun kullanılmadığı anlaşılmaktadır.

8.1.3 X Markası Özelinde Reklam Fonksiyonu

Reklam fonksiyonu bir ürün ya da hizmetin tüketicilere çeşitli mecralarda pazarlanması durumudur. Tüketici marka aracılığı ile markanın garanti ettiği ürün ya da hizmeti tanır. Çoğu kez de satın alma kararını markaya göre verir. Yani markanın kendisi reklam etkisi yaratır. X markası için belirttiğimiz olay örgüsünden de anlaşılacağı üzere sosyal medyada yaşanan olay negatif etkili bir reklam olmakla beraber, ürünler zincir marketlerden kaldırılmış ürüne ulaşım neredeyse imkânsız hale gelmiştir.

8.1.4. X Markası Özelinde Markanın Garanti Fonksiyonu

Marka, sadece bir ürünü ve hizmeti diğer ürünlerden ve hizmetlerden veya ürünü üreten işletmeyi diğer işletmelerden ayırt etmeye yaramaz ayrıca sunduğu malın ve hizmetin kalitesini belirleyen bir unsur haline gelir. Tüketicinin bu markayı kullanarak sunulan mal ve hizmetlerden beklentilerini belirler. Tüketici, satın aldığı, sorun yaşamadığı ve kalitesine güvendiği mal ve hizmetinden memnun kaldığı üreticinin ürünü almayı tercih etmektedir.

X markasının sosyal medya da yaşadığı ve yönetiminde başarılı olamadığı krizden de anlaşılacağı üzere, markanın tüketicinin üzerinde en çok etkiyi bırakan fonksiyonu garanti fonksiyonudur. Tüketici bu konuda yaşadığı sorunun olumlu ve ivedi bir şekilde çözülmesini markanın garanti fonksiyonuna bağlamaktadır. Yaşanılan krizde tüketici ortaya çıkan problemde yapıcı olabileceği imajını çizmiştir. Burada beklenen markanın garanti fonksiyonunu yerine getirip ilgili şikâyet olumlu ve ivedi bir geri dönüş yapılmasıdır. İlgili markaya ait üst düzey yönetici yaşanan soruna karşılık agresif ve kışkırtıcı bir geri dönüş yapmış markanın üretici olduğu kadar tüketiciyi de koruduğunu göz ardı etmiş ve markanın itibarını sarsmıştır.

Sonuç

21. yüzyılın yoğun rekabet ortamında, marka olmak, markalaşmak ve marka itibarının koruması işletmelerin en önemli konulardan biridir. Bu nedenle kriz yönetimi içerisinde bulunduğumuz bu çağda markalar için son derece kritik görülmektedir. Bu nedenle Marka yönetimi, bir işletmenin başarısı için kritik öneme sahiptir. Doğru yapılmadığında piyasadaki konumu ve müşteri algısı olumsuz yönde etkilenebilir. Bu, sadece kısa vadeli satış kayıpları değil, aynı zamanda uzun vadeli marka değerinde kayıplara da yol açabilir

21. yüzyılda bir markanın doğuşu, yükselişi, pazarda yer edinmesi gibi can alıcı ve ekonomik yükümlülüklerini hakkıyla yerine getirmenin çok zor olduğu bir dönemdir. Küresel büyüme, sosyal medya, tüketim alışkanlıkları gibi sebepler bir veya birkaç sektörde bir marka olarak yer edinmek ve tutunmak markanın fonksiyonlarının yerine getirilmesi ile mümkündür. Çalışmamızda bahsettiğimiz “X” firmasının öncelikle menşei belirtme fonksiyonu ile garanti fonksiyonunu yerine getirmediği kamuoyunun en çok dikkat ettiği ve negatif yorum yaptığı iki unsur olmuştur.

Uluslararası algısı yaratılmış olan markanın aslında öyle olmadığı sosyal medya, TV ve yazılı basından çıkan haberlerden sonra anlaşılmıştır. Menşei(kaynak) gösterme fonksiyonu önceleri üreticilere ve firmalara yüklenen tek işlev olarak bilinmektedir. Ancak var olan teknolojik ve ekonomik gelişme ile bu sorumluluklar artmıştır. Menşei fonksiyonu artık üreticilerin ve firmaların kimlik belgesi konumuna gelmiştir. X firması bu kimliklendirmeyi ulusal olduğu halde uluslararası gibi göstermektedir. Bununla birlikte reklam fonksiyonu, ayırt etme fonksiyonu gibi unsurlarında göz ardı edildiği görülmektedir. Tüm bunlar neticesinde markanın zincir market raflarından ürünlerinin toplatılması, kamuoyunda tepkiler nedeniyle satın alınmaması haliyle yüklü bir müşteri kaybı yaşaması markanın ekonomik kaybının boyutunu ortaya koymaktadır.

Marka vizyonunun eksikliği, tutarsız marka mesajlaşması, doğru hedef kitle analizinin yapılamaması, rekabet analizi ve yenilikçi yaklaşımların eksikliği, sürdürülebilirliğe yeterince önem verilmemesi, dijital dönüşüme ayak uyduramamak ve en önemlisi müşteri geri bildirimlerinin göz ardı edilmesi marka yönetimini olumsuz etkileyecek temel taşlardır.

Marka yönetiminde yönetici krizin etkilerini büyük ölçüde azaltabilir. Tabi ki doğru strateji ve doğru davranış seçilmelidir. Eleştiriler kabul edilmeli en önemlisi agresif bir tavır sergilenmemelidir. Halka açık şekilde özür dilemeli ve yaşanan sorun kabul edilmeli bu sayede tüketicinin güveni kazanılmalıdır. Tabi ki pozitif ve negatif tüm yorumlara yer verilmeli tüm eleştirilere cevap verilmelidir. Yapılan tüm müdahalelere rağmen büyük çabalarla oluşturulan bir marka yine de kriz içerisinde ise ilgili kriz kontrol altına alınmaya çalışılarak ve tüketicinin güveni sağlanmalıdır.

Markanın garanti fonksiyonu gereği yaşanan sorun sonrası firma bir rahatlama içerisinde olmamalıdır. Yaşanılan aksilikler sonrasında müşterilerini takip etmeli, tepkilerini değerlendirmeli ve marka olarak yeniden yapılanmalıdır. Hatalarından ders çıkartıp yeni bir yol haritası belirlemelidir. Ayrıca krizi başarı ile atlatabilmek için çalışanlardan ve hedef kitleden kesinlikle bilgi saklanmaması gerekir. Bir marka, tüketicini her türlü problemini çözebilme, şikâyetlerini görebilme, pozitif ve negatif yorumlarına geri dönebilme ve ihtiyaçlarını karşılayabilme yetisi, verdiği garanti gereğidir.

Koçak ve Bayraktar (2019), Haliloğlu (2008) ve Cengiz (2010)'in çalışmalarında markanın garanti ve menşei fonksiyonları incelenmiş olsa bu çalışmalar mevzuat ve pazar araştırması ağırlıklı olduğu görülmektedir. Bu nedenle yaptığımız çalışma isim olarak benzetmekle beraber mevcut olgulardan farklı olarak, olay incelemesinin yapıldığı ve markanın iki önemli fonksiyonu yerine getirilemediği durumu kapsamaktadır. Her iki fonksiyona bağlı olarak da markanın saygınlığının olumsuz yönde etkilenebileceği söylenebilmektedir.

Sonuç olarak, markanın garanti ve menşei fonksiyonun gerekliliklerinin yerine getirilmemesinin sosyal medya da yansımaları incelenmiş, fonksiyonların yerine getirilmesi durumunun markanın doğru yönetilmesi ile paralel olduğu anlaşılmıştır. Dolayısıyla markanın tüketici davranışları etkisinin hukuki metinler üzerinden incelenmesi marka yönetimi açısından etkin olmayabilmektedir. Bu kapsamda markanın menşei ve garanti fonksiyonlarının dikkate alınarak incelenmesi markanın saygınlığını ve bilinirliğini ön plana çıkaracağı düşünülmektedir. Aynı zamanda gelecek çalışmalarda markanın garanti ve menşei fonksiyonları birlikte veya ayrı ayrı birden fazla firma veya firmalar ile fonksiyonlarının yerine getirilmesi ya da getirilmemesi durumlarına göre karşılaştırma yapılabilir. Olumsuz olduğu gibi olumlu örneklerde çalışma konusu edilebilir. Böylelikle marka ve marka yönetimi farklı bir bakış açısıyla değerlendirilmiş olacaktır.

Çıkar Çatışması

Bu çalışmada herhangi bir çıkar çatışması yoktur.

Yazarların Katkıları

Bu çalışma kapsamındaki tüm süreçler ilgili yazarlar tarafından yürütülmüştür.

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The Importance of Market Returns in Financial Return Analysis: US Air Carriers

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ABSTRACT

A financial return can be examined under two different segments: the market dimension and the idiosyncratic dimension. This paper mainly concentrates on this issue in the United States Air Carrier Market. The purpose of this research is to analyse the different financial contexts for air carriers regarding risk (standard deviation). To realize them, after segmenting financial returns as market and idiosyncratic, three forms of simulations, which are uniform (platycurtic), laplace (leptokurtic) and normal (mesocurtic), were utilized, and results were taken. Then, these results were added to the air carriers' idiosyncratic returns, and the new financial returns were formed and interpreted. In all three forms, the returns showed leptocurtic character and three hypotheses of the research were confirmed. On the other side, according to Value-at-Risk (VaR) calculations, standard deviations are indicators of the risk. This research shows that the risk formulation of the financial returns changed depending on the changes in these three market forms. Therefore, the research proves the importance of market returns statistically.

Keywords: Value at Risk, Financial Returns, USA Air carriers market, Standard deviation.

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Cite as: Ölçen, O. (2025). The Importance of Market Returns in Financial Return Analysis: US Air Carriers, *Journal of Business and Trade*, 6(1), 20-33. <https://doi.org/10.58767/joinbat.1556001>

Introduction

The concept of the Value at Risk (VaR) is a calculation of the likely losses that might occur from changes in the market prices of particular securities or portfolio positions. The minimum capital risk requirement (MCRR) or position risk requirement is then defined as the minimum amount of capital required to absorb all but a prespecified proportion of expected future losses (Brooks and Persaud, 2003: 29). With this side, VAR is one of the major instruments in financial risk management (Peng et al, 2023). VAR estimates are not purposed only to serve as summary statistics for decision-makers but it is a beneficial tool to manage and control risk in individual management of stocks or financial portfolio management (Basak and Shapiro, 2001; Jorion, 1996). On the other side, companies and investors give great importance to the communication of VAR. Jorion (2002:911) confirms this relationship by stating empirically that VAR disclosures are informative in that they predict the variability of trading revenues. Essentially, VAR is the measure of variability in an asset price or return. Therefore, it is expressed with only one standard deviation value (scaled version of variance) and includes a lot of information regarding calculation methodology which can be equally weighted moving average (EWMA) approach and general autoregressive and conditional heteroskedasticity models (GARCH (1,1) models), historical simulation or simulation models (Hendricks, 1996; Linsmeier and Pearson, 1996; Giot and Laurent, 2003). Manganelli and Engle (2001) classify them as parametric, nonparametric and semiparametric models. Moreover, Kuester et al. (2006:53) maintain that a hybrid method, combining a heavy-tailed generalized autoregressive conditionally heteroskedastic (GARCH) filter with an extreme value theory-based approach, performs best overall. Maciel (2018) confirms the relationship between GARCH models and VAR by attending to the importance of desired information in different GARCH models. The financial risk subject is a major concern for regulators and owners of financial institutions as a catastrophic market risk and the adequacy of capital to meet such risks (Danielsson and De Vries, 2000). Besides these, Berkowitz et al. (2011) underline another important financial risk calculation method as profit and loss (P/L) analysis by comparing it with VAR. Nevertheless, VAR overcomes P/L according to their analysis. The main features of VAR analysis can be explained as follows; i) It is recognized by practitioners, ii) It measures the downside risk which is interesting for a risk-averse investor like a pension fund, iii) Many academic studies have been done on the subject, iv) it can be measured risk with just one easily understandable number, v) It can be used for non-normally distributed assets. It will adjust the Value-at-Risk method by using an empirical VAR and an analytical VAR, which takes the skewness and the kurtosis into account (Favre and Galeano, 2002). A disadvantage of VAR approaches can be determined as they are extremely sensitive to errors in data. (El Ghaoui et al., 2003). VAR approaches are so general and vital in financial risk measurement, therefore, they are one of the important subjects in the Bank for International Settlements (BIS) statements. On the other side, continuously monitoring procedures of VAR processes is problematic not only for companies but also for regulators because of instant feedback problems (Hoga and Demetrescu, 2022). One of the main development stages of this research is the VAR analysis.

Besides these, there is another reality: the decomposition of a stock return. Essentially, it is a matter of mathematical transformation. There are two important steps in the determination of stock returns. One of them is the distillation of returns from the asset prices, which is an easy process with today's financial market communication with the formula $R_t = (P_t) - (P_{t-1}) / (P_{t-1})$. It is an expression of price (P_t) change and the change algorithm if it is considered in a time series (P_{t1}, P_{t2}, P_{tn}). On the other side, a stock return (R_t) includes a lot of information for a specific time that is summarized as idiosyncratic information (a_t) and market information (b_t). This work mainly concentrates on market information and information structure. Therefore $R_t = a_t + b_t$.

Statistically, the tail features of a distribution can change depending on the variability (σ^2) of the values and are defined under the concept of kurtosis. There are three tail structures of the simulation distribution of this research: fat-tailed (heavy-tailed), thin-tailed (light-tailed) and medium-tailed. They are formed with different distribution simulations.

In light of these arguments, this paper examines the VAR behaviours of ten air carriers of the United States under normality, leptokurtic and platykurtic conditions of the United States financial markets. By doing so, it aims to analyze different VAR structures by variability(σ^2), stress and different information structures of financial markets (b_t) under the assumption that there will be no change in the idiosyncratic (a_t) structure of company financial returns. The selected period has special importance for companies regarding a crisis and the impacts of the crisis on the financial market. At the end of the analysis, there are some policy implications for states and air carrier companies.

Literature Review and Hypothesis Development

The financial management of civil aviation has multiple dimensions because of its characteristic industrial form as it is exemplified in the triangle of Taneja (1990) that consists of economic, political and technological sides. Therefore, the financial stress structure of civil aviation is open to the impacts that come from these sides. Sudden, unexpected and unforecasted events or small, medium and large changes that occur on managerial and operational sides of the cumulative industrial chain and stakeholder climate often hit the financial structure of the aviation industry positively or negatively and the economic structure of the aviation industry demand and supply side. Debnath et al. (2020) state that the financial structure of airlines is under pressure, especially in crisis times. These crisis structures should be followed by also rule-makers and investors because they can cause other important items such as the mobility of human force (O'Regan, 2011).

Akyıldırım et al. (2024) underline the propensity of air carriers toward financial problems even small events in environmental, social and governance sustainability structures by examining 6288 events and emphasizing the importance of reputation. On the other side, safety and security-related operational accidents and incidents (disasters) also have a considerable impact on the financial structure of air carriers by creating volatilities in balanced financial indicators (Akyıldırım et al., 2020). Besides these, in parallel with idiosyncratic industrial structure, there is no exact definition of economic resilience for air carriers depending on different and explained pressures financially (Cook et al., 2023). Reaching finance and economic resources is not easy for air carriers in instantaneous and uninterrupted changes. Faizuloyeva and Olechowska (2021) examine this negativity in the Aeroflot of Russia. In particular, Z scores follow a downward trend because of demand in times of international, regional, national or company catastrophic crisis time as in the case of Aeroflot. In a crisis time, states can nourish all of the closed veins of large air carriers with financial and economic support or can create opportunities for resources, nevertheless, small air carriers suffer from the absence of financial and economic resources (Yu, 2021). For this reason, the financial stimulus and response reflexes, financial awareness and perception levels of air carriers toward micro, macro and international changes and crises should be well-trained. Lanne et al. (2023) state that the stocks give different responses to different economic shocks. Therefore, investors and analysts should concentrate on the tail structure in portfolio analysis (Glasserman et al., 2002).

On the other side, the second important element is the statistical structure of this literature review. In financial epistemology, statistical distributions carry a lot of information. Skewness and kurtosis describe the impacts of the changes on stock returns (Doan, 2011). A thin-tailed probability

distribution is one for which the upper tail declines to zero exponentially or faster. Such a distribution has a moment-generating function, and all moments exist. Conversely, A fat-tailed probability distribution is one for which the upper tail declines towards zero more slowly than exponentially, so there is no moment-generating function (Pindyck, 2010). Besides these, while fat-tailed probability distributions are known as leptokurtic (high kurtosis), thin-tailed probability distributions are platykurtic (low kurtosis) as in the following figures.

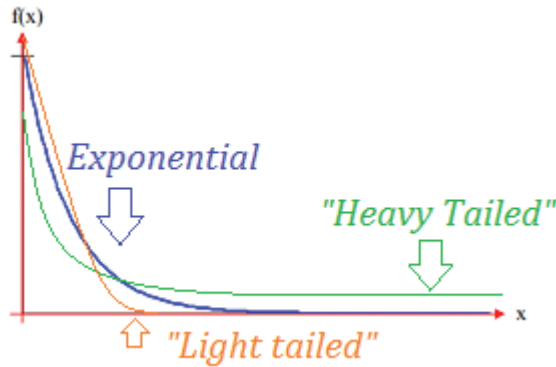


Figure 1. Distributions according to Kurtosis
(<https://www.statisticshowto.com/heavy-tailed-distribution/>, Access time, 06.09.2024.

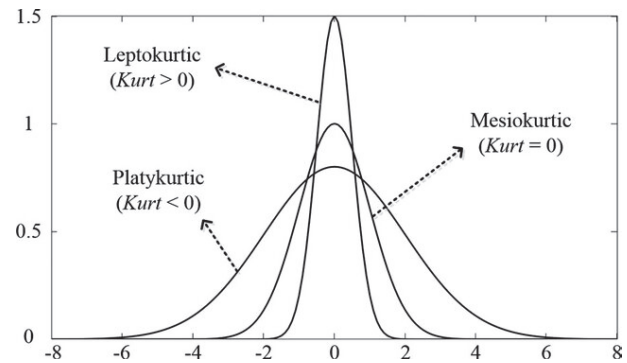


Figure 2. Distributions according to Kurtosis
(Zhong et al., 2016)

The severity and largeness of the deviations (σ_t) are another subject. For example, in a large tail distribution (Z_L) such as a financial time series, large deviations are subject to a jump in the series; on the other side in thin tail distributions, these deviations are subjected to changes in the structure of the distribution (Filiassi et al., 2012). In the analysis of Moser (2017), this situation is explained with the concept of tail risk. Some examples of the distributions are given in the following Table 1.

Table 1: Distributions and their features (Moser, 2017)

| Distribution | Parameters | Mean | Standard Deviation | Risk (approximately) |
|--|--------------------------------|------------|---------------------------|-------------------------|
| <i>Uniform</i> $U[a,b]$ | $a,b \in \mathbb{R}, a < b$ | $(a+b)/2$ | $\frac{(b-a)}{2\sqrt{e}}$ | 0 |
| <i>Exponential</i> $\varepsilon(\theta)$ | $\theta > 0$ | $1/\theta$ | $1/\theta$ | 1.83 |
| <i>Laplace</i> $L(\mu, b)$ | $\mu \in \mathbb{R}, b > 0$ | μ | $\sqrt{2b}$ | 1.44 |
| <i>Normal</i> $N(\mu, \sigma)$ | $\mu \in \mathbb{R}, \sigma^2$ | μ | σ | 0.27 |

Fama (1965) showed that empirical distributions of daily returns are usually highly peaked and heavy-tailed when compared with normal distribution. Lau et al. (1990) prove that the distribution of stock returns is leptokurtic. Also, according to Stoyanov et al. (2011) and Hall et al. (1989), fat tails are specific characteristics of asset returns because of volatility, mostly time-varying volatility, and secondly, other factors ensure non-linearity in asset returns. On the other side, Praetz (1972) describe

the subject of changing tails as the change in investor expectations. Perry (1983) observes that fat tails of security return distributions are not an infinite variance but a finite variance that changes in a complex fashion over time. Haas and Pigorsch (2007) define leptokurtosis's fat-tailedness by emphasising that they are deviations from normal distribution. Because of the tail features of the financial assets, they can be classified as risky or non-risky. Moreover, for Gay (2005), thin tails mean relatively less risk; on the other hand, fat or heavy tails are indicators of high risk in asset evaluation.

Under these circumstances, it is considered that a stock price includes systematic information (risk) and idiosyncratic information (risk), and the returns have these two dimensions, which are market returns and exceptional returns. The air carriers subjected to these papers represent approximately 95% of the total market. The following hypotheses can be developed in light of these arguments.

H1: As other variables are constant (such as time (period) and amount of volatility (magnitude) of idiosyncratic return), if an idiosyncratic return (a_t) is leptokurtic (fat-tailed), and if a market return (b_t) is leptokurtic (fat-tailed), the company return (R_t) is leptokurtic (fat-tailed).

H2: As other variables are constant (such as time (period) and amount of volatility (magnitude) of idiosyncratic return), if an idiosyncratic return (a_t) is leptokurtic (fat-tailed), and if a market return (b_t) is platykurtic (thin-tailed), the company return (R_t) is leptokurtic (fat-tailed).

H3: As other variables are constant (such as time (period) and amount of volatility (magnitude) of idiosyncratic return), if an idiosyncratic return (a_t) is leptokurtic (fat-tailed), and if a market return (b_t) is mesokurtic (generally normal-tailed), the company return (R_t) is leptokurtic (fat-tailed).

The outliers principle should be considered in the second and third hypotheses. An outlier can be defined as extraordinary values in a time series or an observation that lies outside the overall pattern of distribution (Moore and McCabe 1999). Therefore, Fat-tailed distributions tend to have more outliers than thin-tailed distributions. In this condition, the outliers of the Z distribution of a variable is Z_a and outliers are $(a_{1,t}, a_{2,t-1}, a_{n,t-n})$ and if Z_a is leptokurtic, logically it will insist on preserving its outliers structure when it is added to a platykurtic Z_b distribution with outliers $(b_{1,t}, b_{2,t-1}, b_{n,t-n})$, in total, the company return outliers are going to be $(a_{1,t}, a_{2,t-1}, a_{n,t-n}, b_{1,t}, b_{2,t-1}, b_{n,t-n})$. There will be many outliers in the return; the Z_R will have many outliers and will be leptokurtic.

Data, Methodology and Findings

The research data is taken from investing.com for the period of 1.02.2018 and 29.12.2023 as the daily closing stock price for ten air carriers, NASDAQ and NYSE randomly. The full names and their stock market are in Appendix 1, and their statistics are in Tables 2.1, 2.2, and 2.3.

Table 2.1: The descriptive statistics of the price variables are given in the following tables.

| Statistics | <i>NASDAQ</i> | <i>NYSE</i> | <i>AAL</i> | <i>ALGT</i> | <i>ALK</i> |
|---------------------------|---------------|--------------|-------------|--------------|--------------|
| Mean | 0.000595265 | 0.000233169 | 23.19053015 | 139.2493307 | 53.49059642 |
| Standard Error | 0.000402197 | 0.000321461 | 0.28974651 | 1.115847828 | 0.298048645 |
| Median | 0.001141586 | 0.000698226 | 18.8 | 138.75 | 55.42 |
| Mode | #N/A | #N/A | 13.98 | 142 | 43.46 |
| Standard Deviation | 0.015514574 | 0.012396065 | 11.25544924 | 43.34605646 | 11.57795272 |
| Sample Variance | 0.000240702 | 0.000153662 | 126.6851376 | 1878.880611 | 134.0489892 |
| Kurtosis | 6.303584542 | 15.80051049 | 0.374634611 | -0.203766677 | -0.931168615 |
| Skewness | -0.411692474 | -0.78039549 | 1.073006739 | 0.345659229 | -0.357580889 |
| Range | 0.216673274 | 0.218725294 | 49.43 | 211.75 | 51.45 |
| Minimum | -0.123213306 | -0.118365278 | 9.04 | 57.06 | 23.56 |
| Maximum | 0.093459968 | 0.100360015 | 58.47 | 268.81 | 75.01 |
| Sum | 0.885754248 | 0.346722534 | 34994.51 | 210127.24 | 80717.31 |
| Observation | 1482 | 1482 | 1482 | 1482 | 1482 |

Table 2.2: The descriptive statistics of the variables are given in the following tables.

| Statistics | <i>DAL</i> | <i>HA</i> | <i>JBLU</i> | <i>LU</i> | <i>SAVE</i> |
|---------------------------|--------------|--------------|--------------|--------------|-------------|
| Mean | 43.57813121 | 21.5780053 | 13.90270378 | 45.48075547 | 29.90507621 |
| Standard Error | 0.264113688 | 0.251554764 | 0.130183225 | 0.271015922 | 0.344214435 |
| Median | 42.2 | 19.91 | 14.95 | 47.25 | 24.61 |
| Mode | 52.95 | 13.77 | 7.1 | 54.98 | 16.5 |
| Standard Deviation | 10.25972048 | 9.771858416 | 5.057077909 | 10.52784363 | 13.37130202 |
| Sample Variance | 105.2618643 | 95.48921691 | 25.57403698 | 110.8354915 | 178.7917177 |
| Kurtosis | -1.067361581 | -0.853935717 | -1.241387029 | -1.056997468 | -0.69869527 |
| Skewness | -0.04058469 | 0.334407245 | -0.311108174 | -0.217407265 | 0.62178313 |
| Range | 43.97 | 40.04 | 19.24 | 44.06 | 56.58 |
| Minimum | 19.19 | 3.91 | 3.69 | 22.23 | 8.01 |
| Maximum | 63.16 | 43.95 | 22.93 | 66.29 | 64.59 |
| Sum | 65759.4 | 32561.21 | 20979.18 | 68630.46 | 45126.76 |
| Observation | 1482 | 1482 | 1482 | 1482 | 1482 |

Table 2.3: The descriptive statistics of the variables are given in the following tables.

| Statistics | <i>DAL</i> | <i>HA</i> |
|---------------------------|--------------|--------------|
| Mean | 42.46284957 | 57.27431412 |
| Standard Error | 0.366361561 | 0.519262327 |
| Median | 43.65 | 49.46 |
| Mode | 56.35 | 67.52 |
| Standard Deviation | 14.23162594 | 20.17118605 |
| Sample Variance | 202.5391768 | 406.8767467 |
| Kurtosis | -1.182253953 | -1.202342942 |
| Skewness | -0.288051421 | 0.465346127 |
| Range | 54.13 | 76.78 |
| Minimum | 12.07 | 19.92 |
| Maximum | 66.2 | 96.7 |
| Sum | 64076.44 | 86426.94 |
| Observation | 1482 | 1482 |

To calculate total return, the $R_t = p_t - p_{t-1} / p_{t-1}$ formula is utilized for the airline price series. Then, to describe a_t the idiosyncratic return in number, the formula of $b_t = R_t - a_t$ (market return) is used. On the other side, to describe new market dynamics, uniform (Z_U), normal (Z_N), and Laplace (Z_L) distributions are derived by the Stata package program under the features described in Table 1. For Z_U , $a = 0.001$ and $b = 0.05$; For Z_N , $\mu = 0.001$ and $\sigma = 0.05$ and; For Z_L , $\mu = 0.001$ and $b = 0.05$ and new series are obtained randomly with related parameters. The descriptive features of the new series are given in Table 3.

Table 3: Descriptive statistics of the new series

| Statistics | Z_U | Z_N | Z_L |
|---------------------------|--------------|--------------|--------------|
| Mean | 0.025760594 | 0.003139598 | -0.000436577 |
| Standard Error | 0.000366728 | 0.00129794 | 0.001847796 |
| Median | 0.0258046 | 0.0025535 | 0.0002996 |
| Mode | 0.0445557 | -0.0030742 | -0.0722151 |
| Standard Deviation | 0.014113065 | 0.049949619 | 0.07111014 |
| Sample Variance | 0.000199179 | 0.002494964 | 0.005056652 |
| Kurtosis | -1.201769832 | -0.200077025 | 3.176802375 |
| Skewness | -0.03315116 | 0.040730351 | 0.08673889 |
| Range | 0.0489053 | 0.3380813 | 0.6874679 |
| Minimum | 0.0010714 | -0.1684551 | -0.3235674 |
| Maximum | 0.0499767 | 0.1696262 | 0.3639005 |
| Sum | 38.1514394 | 4.649745 | -0.6465705 |
| Observation | 1482 | 1482 | 1482 |

Z_U , Z_N , and Z_L series are added to a_t values of each air carrier and 3 new series of $a_i Z_{Ui}$, $a_i Z_{Ni}$, and $a_i Z_{Li}$ and $i=[1,10]$ are ensured for 10 air carriers. The descriptive statistics of the 40 series (a_t , $a_i Z_{Ui}$, $a_i Z_{Ni}$, and $a_i Z_{Li}$) are in Appendix 2.

Table 4: Standard Deviation Ratio of Airline Companies

| Airlines | Standard Deviation (VaR) | | | |
|----------|--------------------------|---------------------|---------------------|---------------------|
| | σa_i | $\sigma a_i + ZU_i$ | $\sigma a_i + ZN_i$ | $\sigma a_i + ZL_i$ |
| LUV | 0.019033 | 0.023584 | 0.002703 | 0.075028 |
| SKYW | 0.033667 | 0.036645 | 0.059437 | 0.07868 |
| ALK | 0.022479 | 0.037592 | 0.096756 | 0.091956 |
| DAL | 0.022617 | 0.026867 | 0.055394 | 0.075026 |
| UAL | 0.031356 | 0.034814 | 0.059597 | 0.078237 |
| ALGT | 0.027713 | 0.031576 | 0.053408 | 0.031576 |
| AAL | 0.033287 | 0.036539 | 0.060474 | 0.078789 |
| JBLU | 0.030016 | 0.033404 | 0.05876 | 0.077369 |
| HA | 0.062673 | 0.065003 | 0.079471 | 0.095709 |
| SAVE | 0.035442 | 0.038063 | 0.061022 | 0.081051 |

Discussions, Conclusion And Suggestions

The use and utilization of distributions in the risk-oriented analysis are general in financial literature (Arbia et al., 2020; Hagerman, 1978), and their importance is also confirmed by Akgiray and Booth (1988) and Goldie and Grübel (1996). The research is designed on three important hypotheses. According to the results, all of the hypotheses are supported in the air carriers industry of the United States. In probability, fat-tailedness means leptokurtic distribution and high-risk behaviour in time series. Otherwise, thin-tailedness is referred to as platykurtic distribution and low-risk behaviour in the dataset. The hypothesis table is given in Table 6 for idiosyncratic (a_t) and market (systematic) (b_t) components of the stock return (R_t).

Table 5: Hypotheses Table

| Condition | Return component | | Total Return (R_t) | Risk |
|---------------------|------------------|------------------------------------|------------------------|-------------|
| | a_t | b_t | | |
| 0 | Leptokurtic | No market return | Leptokurtic | The lowest |
| Hypothesis 1 | Leptokurtic | Leptokurtic (Laplace Distribution) | Leptokurtic | The highest |
| Hypothesis 2 | Leptokurtic | Platykurtic (Uniform Distribution) | Leptokurtic | Higher |
| Hypothesis 3 | Leptokurtic | Mesokurtic (Normal Distribution) | Leptokurtic | Much Higher |

For the period of 1.02.2018 to 29.12.2023, it can be said that the idiosyncratic nature of the company returns is especially high because of the COVID-19 process. This paper hypothetically tries to change the market financial structure with the data derived from uniform, Laplace and normal distributions. They can be the examples of the utmost form of Platy, Lepto and Meso kurtosis. The returns are the riskiest form in the third condition, and one of the causes of it can be the outlier principle. According to the literature, these findings show conformity with the analysis of Lu and Chen (2010), which states that the leptokurtic distributions include high risks in the oil price risk in transportation services. Mahmoud and Naoui (2018) and Ha (2022) state that leptokurtic distributions reflect higher losses and profits than a normal distribution. Therefore, the higher the kurtosis is, the higher the probability of having significant losses or profits. It should be not forgotten that market risks carry systematic characteristics (Hedström et al., 2022). Sarraj and Mabrouk (2021) and Duan and Wei (2009) underline that systematic risk models can carry leptokurtic characteristics. Gradojevic and Caric (2017) state that the description of systematic risks and their detection of them are important for market participants.

This research is designed to detect the correct financial structure for companies and investors. In particular, the situation of institutional and individual investors can change depending on the financial market conditions. This research proves the impacts of market returns on stock returns. For this cause, financial market participants should follow the market-based risk to yield more profit or to benefit from volatile structures.

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Appendix 1: The list of US air carriers and their markets.

| | |
|------|---------------------------------------|
| LUV | Southwest Airlines Co (NYSE) |
| DAL | Delta Air Lines Inc (NYSE) |
| UAL | United Airlines Holdings Inc (NASDAQ) |
| ALL | American Airlines Group Inc (NASDAQ) |
| ALK | Alaska Air Group Inc (NYSE) |
| JBLU | JetBlue Airways Corp (NASDAQ) |
| SAVE | Spirit Airlines Inc (NYSE) |
| ALGT | Allegiant Travel Co (NASDAQ) |
| SKYW | SkyWest Inc (NASDAQ) |
| HA | Hawaiian Holdings Inc (NASDAQ) |

Appendix 2: The descriptive statistics

| | LUV | LUV1P | LUV1L | LUV1M | SKYW | SKYW1 P | SKYW1 L | SKYW1 M | ALK | ALK1P | ALK1L | ALK1M | DAL | DAL1P | DAL1L | DAL1M |
|--------------------|----------|----------|----------|----------|----------|------------|------------|------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Mean | -0.00044 | 0.025324 | -0.00087 | 0.002703 | 8.76E-05 | 0.025848 | -0.00035 | 0.003227 | -0.00013 | 0.026318 | 0.000893 | 0.005044 | -4.3E-05 | 0.025717 | -0.00048 | 0.003096 |
| Standard Error | 0.000495 | 0.000613 | 0.00195 | 0.001388 | 0.000875 | 0.000952 | 0.002044 | 0.001544 | 0.000584 | 0.000977 | 0.002389 | 0.002514 | 0.000588 | 0.000698 | 0.00195 | 0.001439 |
| Median | -0.00048 | 0.024815 | -0.00078 | 0.000812 | -0.00103 | 0.025587 | -0.00111 | 0.00263 | -0.00023 | 0.025562 | -0.00094 | 0.002478 | -0.00032 | 0.024976 | -0.00082 | 0.00056 |
| Mode | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| Standard Deviation | 0.019033 | 0.023584 | 0.075028 | 0.053408 | 0.033667 | 0.036645 | 0.07868 | 0.059437 | 0.022479 | 0.037592 | 0.091956 | 0.096756 | 0.022617 | 0.026867 | 0.075026 | 0.055394 |
| Sample Variance | 0.000362 | 0.000556 | 0.005629 | 0.002852 | 0.001133 | 0.001343 | 0.006191 | 0.003533 | 0.000505 | 0.001413 | 0.008456 | 0.009362 | 0.000512 | 0.000722 | 0.005629 | 0.003069 |
| Kurtosis | 4.99434 | 1.851705 | 2.798146 | -0.08295 | 34.33097 | 25.91307 | 3.24844 | 2.938402 | 9.640325 | 376.6249 | 167.8565 | 665.6407 | 10.7623 | 5.838224 | 2.741854 | 0.015878 |
| Skewness | 0.044509 | 0.08037 | 0.083967 | 0.099629 | 0.332524 | 0.134588 | 0.166431 | 0.094551 | 0.319288 | 13.83434 | 7.538264 | 21.15725 | -0.08544 | -0.04481 | 0.11902 | 0.121498 |
| Range | 0.232736 | 0.243497 | 0.684809 | 0.332179 | 0.814698 | 0.834081 | 0.837606 | 0.792887 | 0.330255 | 1.187899 | 2.395783 | 3.226357 | 0.333023 | 0.340772 | 0.692831 | 0.384792 |
| Minimum | -0.13022 | -0.10461 | -0.32853 | -0.16411 | -0.40107 | -0.39502 | -0.37019 | -0.39229 | -0.16003 | -0.1346 | -0.34248 | -0.17305 | -0.19247 | -0.16704 | -0.33162 | -0.2055 |
| Maximum | 0.102514 | 0.138888 | 0.35628 | 0.16807 | 0.413623 | 0.439056 | 0.467421 | 0.400599 | 0.170225 | 1.053302 | 2.053302 | 3.053302 | 0.140551 | 0.173733 | 0.361214 | 0.179295 |
| Sum | -0.64617 | 37.50527 | -1.29274 | 4.003571 | 0.129742 | 38.28118 | -0.51683 | 4.779487 | -0.19893 | 38.97688 | 1.322432 | 7.469872 | -0.06439 | 38.08704 | -0.71097 | 4.58535 |
| Count | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 |

Olçay Ölçen
The Importance of Market Returns in Financial Return Analysis: US Air Carriers

| | UAL | UAL1P | UAL1L | UAL1M | ALGT | ALGT1P | ALGT1L | ALGT1M | AAL | AAL1P | AAL1L | AAL1M |
|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Mean | -0.0003 | 0.025462 | -0.00074 | 0.002841 | -0.00052 | 0.025242 | -0.00096 | 0.002621 | -0.00085 | 0.024908 | -0.00129 | 0.002287 |
| Standard Error | 0.000815 | 0.000905 | 0.002033 | 0.001549 | 0.00072 | 0.000821 | 0.001981 | 0.0015 | 0.000865 | 0.000949 | 0.002047 | 0.001571 |
| Median | -0.00118 | 0.024345 | -0.00096 | 0.001683 | -0.00097 | 0.024498 | -0.00054 | 0.001647 | -0.00235 | 0.02266 | -0.00293 | 0.000362 |
| Mode | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| Standard Deviation | 0.031356 | 0.034814 | 0.078237 | 0.059597 | 0.027713 | 0.031576 | 0.076224 | 0.057709 | 0.033287 | 0.036539 | 0.078789 | 0.060474 |
| Sample Variance | 0.000983 | 0.001212 | 0.006121 | 0.003552 | 0.000768 | 0.000997 | 0.00581 | 0.00333 | 0.001108 | 0.001335 | 0.006208 | 0.003657 |
| Kurtosis | 11.44093 | 7.968269 | 2.47123 | 0.610005 | 9.751645 | 5.229375 | 2.46508 | 0.457893 | 24.56442 | 16.86168 | 2.770236 | 1.617795 |
| Skewness | 0.393873 | 0.294516 | 0.084108 | 0.1792 | 0.488681 | 0.244837 | 0.106175 | 0.183032 | 2.08271 | 1.605183 | 0.135401 | 0.425598 |
| Range | 0.462593 | 0.467287 | 0.681822 | 0.501844 | 0.447484 | 0.432859 | 0.69218 | 0.517527 | 0.623119 | 0.626807 | 0.807479 | 0.604248 |
| Minimum | -0.25587 | -0.23044 | -0.3294 | -0.2689 | -0.23627 | -0.21084 | -0.32675 | -0.2493 | -0.20522 | -0.17979 | -0.38875 | -0.21824 |
| Maximum | 0.206719 | 0.236846 | 0.352427 | 0.232946 | 0.211213 | 0.22202 | 0.365429 | 0.268231 | 0.4179 | 0.447022 | 0.418727 | 0.386005 |
| Sum | -0.44257 | 37.70887 | -1.08914 | 4.207178 | -0.76831 | 37.38313 | -1.41488 | 3.881438 | -1.26286 | 36.88858 | -1.90943 | 3.386884 |
| Count | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 | 1481 |

Perceptions of the Barriers to Localization Before and During the Covid-19 Pandemic: “A Case of Turkish Machinery Manufacturers”

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ABSTRACT

Purpose: COVID-19 caused disruptions in international supply chains. Localization is one of the ways of dealing with this problem. Thus, this paper analyzes Turkish machinery manufacturing companies' perceptions regarding the barriers against localization pre and mid-COVID-19 to see whether the perceptions changed. In addition, the study applies Porter's Diamond Model as a framework to assess whether COVID-19 is perceived as a pressure to upgrade the industry's competitiveness.

Design/Methodology/Approach: The research design of the study was determined as a case study. The reason for this is that the case study is an empirical research form that investigates a current phenomenon and real life in depth with a single or a few units. In this context, the sample of the study was determined as the member companies of Sakarya Machinery Manufacturers Association. In the interviews with these companies, open-ended questions were administered in order to reveal the perceptions of barriers to localization. The interviews were deciphered and open coded. Findings were obtained through qualitative content analysis. In the analysis process, which was handled in two stages, 47 producers before the pandemic and a smaller group of 32 people during the pandemic were evaluated. It was concluded that there are significant perceived barriers to the production and marketing of domestic substitutes.

Findings: Marketing substitutes for previously imported products is perceived as more challenging than producing them. The presence of strong global competitors discourages SMEs from producing substitutes. Some participants have experience in both producing and purchasing domestic substitutes, which further discourages them from making another attempt. The main concerns are the lack of acceptable quality and price advantages. Additionally, the need to achieve economies of scale and limited domestic demand prevent manufacturers from investing in domestic substitutes. The time required to reach high production volumes and quality, along with the unstable macroeconomic environment in Turkey, appear to be two additional factors beyond the Diamond Model. These barriers seem to have changed slightly during the mid-COVID-19 period.

Originality/Value: This paper handles localization both as a solution to supply chain disruptions and an opportunity to increase the competitiveness of the industry. Insights in localization by evaluating the barriers perceived by the Turkish machinery manufacturing industry in a longitudinal manner (pre-mid COVID 19 period) will deepen the concept for further research, especially in developing world.

Keywords: Domestic Substitutes, Localization, The Diamond Model, COVID-19, Machinery Industry, Manufacturing

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Cite as: Onur, T., Garip, B., Karataş, A. (2025). Perceptions of the Barriers to Localization Before and During the Covid-19 Pandemic: “A Case of Turkish Machinery Manufacturers. *Journal of Business and Trade*, 6(1), 34-55. <https://doi.org/10.58767/joinbat.1564150>

1. Introduction

The World Health Organization reported 1,438 epidemic diseases between 2010 and 2018 (Hudecheck, 2020). Due to its worldwide spread, the economic impacts of COVID-19 have been greater than any of the previous epidemics. Many countries implemented lockdowns, manufacturing stopped, and product shipments slowed down because of the travel restrictions and new tariff regulations (Hu, 2022). These impacts have particularly been felt in the manufacturing sector and will continue in the medium and long term.

The machinery industry is a main sector that provides inputs such as investment and intermediate goods to all sectors of the manufacturing industry (Tuncel and Polat, 2016). It lies at the heart of the production and diffusion of technical change. Advances in processes and products invariably require improved machinery (Fransman, 1986). This industry has particular importance for Turkey due to its promising export and manufacturing potential (Tektaş *et al.*, 2008). It has been the second-biggest exported product group for nearly two decades (Trademap, 2022).

This industry also has been affected by the supply chain interruptions caused by COVID-19. However, Porter (1990), in his "Competitiveness of Nations" article, gives inspiring examples of turning disadvantages into opportunities. In the 1973 energy crisis, the Italian tile industry found an effective way to produce tiles faster with less energy, resulting in efficiency. Another example is the Swiss companies which upgraded their labor productivity resulting from labor shortage after World War II. According to Porter, "*Part of a company's responsibility is to play an active role in forming clusters and working with its home-nation buyers, suppliers, and channels to help them upgrade and extend their competitive advantages.*" Localization is both an opportunity and a responsibility for companies during the Covid-19 period. In the lights of Porter's (1990) Diamond Model, can the supply chain interruptions be evaluated as a pressure on Turkish machinery manufacturers to enhance their supply chain capability? Because companies can gain competitive advantage through supply chain responsiveness (Golgeci and Gligor, 2017). As a result, a strong supply chain disruption orientation can create a competitive advantage (Ponomarov and Holcomb, 2009).

Previously, these companies were used to import some of the components and semi-products to manufacture their final products. During the pandemic, reaching these supplies on time was quite challenging. Local alternatives to the imported supplies will be alternatives if they exist. Even if they exist, purchasing them may not be rational because of their performance, price, quality, etc. Producing the supplies independently can also be an option if the technological requirements are provided. However, product quality issues may still be problems. These companies' perceptions regarding localization barriers are highly significant because these perceptions can be evaluated as the antecedents of their possible actions.

The primary aim of this qualitative study is to discover the barrier perceptions of Turkish machinery manufacturers regarding local production and procurement, in other words, localization, before and during Covid -19 pandemic. With the help of the results gained, we aim to see whether this disruption can be a pressure that contributes to the competitiveness of these companies.

This paper consists of three parts. In the first part, COVID-19 and similar disruptions and the measures taken in response to these disruptions, together with the competitive position of the Turkish machinery manufacturing industry, are handled. In the second part, the changes in the perceptions of Machinery Manufacturers' Association members operating in Sakarya towards domestically produced goods before and during COVID-19 are tried to be discovered. Lastly, the results are discussed in light of the Diamond Model.

2. Literature Review

2.1. Disruptions in Global Supply Chains

As a result of the acceleration of international trade and the cost advantages of overseas production, supply chains have become global. However, as in every structure, the supply chain's increasing complexity and uncertainty over time have caused disruptions. These uncertainties can lead to supply, production, and distribution channel interruptions. In 2018, even before the COVID-19 pandemic, EventWatch reported that disruptions in supply chains had reached their highest rate in the last three years (SCI Week, 2019).

In the literature, disruptions are divided into different categories by different authors. (Wagner and Bode (2008) identified five categories of disruption: demand-side, supply-side, regulatory/legal/bureaucratic, infrastructure, and catastrophic. However, Schmitt *et al.* (2017) divided disruptions into three categories: natural (e.g., earthquakes and tsunamis), accidental (e.g., the Mexican Gulf oil spill), and intentional (e.g., the terrorist attacks in Paris in 2015). Scmitt *et al.* (2017) and Ivanov (2019) also classified natural diseases, artificial diseases, political crises, strikes, and legal conflicts as disruptions. Natural diseases are the riskiest and most common disruptions. For instance, the earthquake and tsunami in Japan in 2011 significantly affected the global production of semiconductor materials. The inadequacy of supplies caused camera prices to increase, especially for companies such as Nikon and Canon (Kumar *et al.* , 2018). COVID-19 seems to be an international and natural type.

Even before the pandemic, the business world had begun to question its global supply chain structures because of trade wars, protectionist policies, and non-tariff barriers or some other reasons. The COVID-19 pandemic accelerated this process. Because it can be the most significant disruption that has affected commercial relationships and integration between most countries worldwide. COVID-19 has significantly increased the demand for primary products while reducing the supply of raw materials due to restrictions in production capacity. This has disrupted both supply chains and production planning. The crisis spread rapidly through the manufacturing industry because of the global integration of trade and supply chains.

The sudden and unpredictable changes in consumer demand and slowdown in production activities have caused an economic slowdown worldwide. The economic contraction that started in China has spread, first to Europe and then to North America. EU countries have experienced their most significant decline since the global financial crisis in 2008, with industrial production falli 17% in April 2020, leading to an annual decline of 28 % (Eurostat, 2020). The impact of logistics delays on commodity prices has also contributed to the contraction in production. The Free Market Commodity Price Index (FMCPI) fell below 20% in one month for the first time. Commodity prices, which fell to 18.6% during the global financial crisis, decreased significantly during the pandemic (CCSA, 2020). According to the OECD, China's growth, foreign direct investment, and ties to other countries through its supply chain network have increased the effects and costs of the virus. Therefore, trade has played an essential role in spreading the effects of COVID-19 (Congressional Research Service, 2021).

According to Statista (2020), China holds a 20% share of the global semifinished goods market, representing a critical part of the global value chain in the machinery sector. The effects of COVID-19 on the Chinese economy have spread to the economies of many other countries. For example, a 2% decrease in exports of Chinese semifinished machinery goods to the European Union (EU) is projected to cause a loss of USD 1.2 billion in the EU machinery sector (Statista, 2020).

According to the report, the economic effects of the pandemic spread through three main trade channels:

(1) directly through supply chains as reduced economic activity spreads from intermediate goods producers to finished goods producers;

(2) as a result of a drop overall in economic activity, which reduced demand for goods in general, including imports;

(3) reduced trade with commodity exporters that supplied producers, which, in turn, reduced their imports and negatively affected exporters' trade and economic activity.

World trade volume decreased by approximately 8% in 2020 (Trademap, 2021). Thanks to the ongoing vaccination process, most of the world's economies began to recover from the pandemic in the first quarter of 2021. The pandemic has caused companies to question the wisdom of investing in distant countries to gain a cost advantage and access global supply chains. The simplification of operational processes, which began in the 1990s through reforms such as reducing inventory levels and establishing multi-layered supply chain structures (Wuest et. Al., 2020) has caused problems that need to be addressed during pandemics.

The long-term impact of the pandemic on the supply chain is still unclear (Yoo and Managi, 2020). Supply chains should reconfigure themselves to manage increasing complexity due to more volatile, uncertain and ambiguous business environments that will bring them closer (Christopher, 2016). The production and supply centers being located close to each other (nearshoring), diversifying suppliers, or identifying alternative local suppliers (localization) can decrease the risk of disruptions and reduce dependency. Companies should think hard more than ever on this issue, especially the SMEs. Because any adverse change in the relationship between an SME and its key supplier or the loss of key production materials could potentially result in significant production and operation disruptions, leading to a higher rate of business failure (Liu and Park, 2021).

Generally, there are two main elements of risk management in response to disruptions: proactive strategies that are implemented before the disruption and reactive strategies that are implemented after the disruption. Proactive strategies include preventing risks by developing digital and technical infrastructure (Ralston and Blackhurst, 2020; Hofmann *et al.* , 2019), sourcing locally or from nearby areas (Kochan and Nowicki, 2018; Iakovou, 2014), and managing risks (Zhu *et al.* , 2017). Reactive strategies include revising business plans (Hernantes *et al.* , 2017; Zsidisin *et al.* , 2005) and determining stock and inventory levels (Lücker *et al.* , 2019; Simchi-Levi *et al.* , 2015).

Due to the proliferation of lean and global supply chain structures, which are highly fragile, proactive approaches have gained importance. In light of the pandemic, the dependency on Asian countries for importing intermediate goods has placed many manufacturers in a difficult situation. In this context, proactive strategies such as favoring domestic products and localizing suppliers are important solutions to the risks created by global supply dependency. For instance, the automotive industry has made improvements in this area, including developing localized sources of supply and using advanced industry 4.0 technologies to mitigate the risks of COVID-19 (Belhadi *et al.* , 2021) The other example is the Asian +1 supplier selection approach has emerged as a risk management strategy.

On the other hand, doing business with local suppliers or procuring goods from nearby regions may also have some disadvantages. Given that global resources tend to have lower prices or higher quality than local alternatives, firms usually favor them. In particular, multinational companies procure raw materials from overseas suppliers rather than local ones (Niu *et al.* , 2020). In contrast, Hoek (2020) questioned the advantages of global resources' total cost of ownership, noting that nearshoring is more effective. Moreover, disruptions and an inability to manage risks can place importing companies at a

disadvantage. Companies should now take unforeseen situations into account in their risk management strategies.

2.2. Insights of the Diamond Model

"No nation can be competitive in everything." Porter (1990) says. Among most other industries, the machinery industry is important for the Turkish economy. Because many more industrialized developing countries such as Argentina, Brazil, India, China, South Korea, and Taiwan are substantial producers and, in some cases, exporters of machinery (Fransman, 1986). Although Turkey is in the 27th rank in the list of the biggest machinery exporting countries, machinery (HS 84) has been the second biggest export product group for decades. Additionally, the rate of innovative companies in the machinery industry is high compared to Turkey's average (Tuncel and Polat, 2016). In accordance with the importance of the industry for the economy and its innovative appearance, Turkish Industry and Technology Ministry specified the industry as one of the primary industries in the "2023 Industry and Technology Strategy Report"(Sanayi ve Teknoloji Bakanlığı, 2023).

Diamond Model, offered by Porter (1990), is adopted for analyzing the competitive positions of various industries in different regions (Fang *et al.* , 2018) in previous research (Zhao *et al.* , 2011; Chobanyan and Leigh, 2006; Curran, 2000). So many researchers employ this model because of its creative way of handling the factors of previous models and its ability to provide feasible results (Chung, 2016).

To take a close look at the Diamond Model, Porter (1990) offers four attributes to a nation's competitiveness: factor conditions, demand conditions, related and supporting industries, and the firm's strategy, structure, and rivalry. Although the article's name is called from a macro perspective, Porter underlines that only companies can achieve and sustain competitive advantage. This point is also criticized by Clancy *et al.* (2001). Adopting the micro perspective, being productive and innovative are the two vital requirements for companies to be competitive. In this context, the role of the government should be a catalyst and challenger which encourages the companies to be more competitive. Porter (1990) advises innovating to offset local factor disadvantages rather than outsourcing and developing domestic suppliers and buyers rather than relying on foreign ones. The emphasis on localization to be competitive is the main reason why the Diamond Model is inspiring for this study. To evaluate Turkish machinery manufacturers' competitive position and to have an opinion about the missing conditions, the model would help to make some comments. The attributes required to be competitive, which Porter (1990) offers, and the previous literature focused machinery manufacturing industry are tried to be harmonized below:

Factor Conditions: According to the model, a nation should only have some of the factors of production required for the product. It can simply import the rest without an impact on innovation. The factors that do not have a specific impact on sustainable competitiveness are fundamental and generalized. On the other hand, advanced or specialized factors are necessary for more sophisticated forms of competitive advantage. A basic factor is passively inherited, such as semiskilled labor, while advanced factors include education institutions that help to create highly-skilled ones (Jin and Moon, 2006).

Machinery manufacturing requires highly-skilled labor, technology, and raw materials (Tektas *et al.* , 2008). Highly skilled labor with an accumulation of mechanical engineering and software knowledge are critical inputs for innovation in the industry. According to Porter's classification of factors, raw materials are basic inputs that can be exported, and highly skilled labor with an

accumulation of knowledge in mechanical engineering and software is an example of advanced factors which should be created domestically.

Demand Conditions: Sophisticated, demanding buyers create pressure on companies to meet high standards such as upgrading technology, quality improvement, and higher production performance with better services (Kharub and Sharma, 2016). Bayülken (2012) defines the development of the manufacturing industry supporting Porter. For the researcher, the engineering discipline is mobilized, and the designation of development speed and production compositions is according to the new needs and demands. Customer requirements largely determine the direction of the innovation process in the machinery industry. Tuncel and Polat (2016) have some comments on machinery manufacturing market conditions:

- New products are often developed for a specific need of the user, and they are launched into the market.
- Monopolistic competitive market conditions dominate the market.
- Companies specialize in product niches and differentiate from their rivals through their product.
- Technology cooperation between firms and customers is common.
- It is too difficult to take advantage of scale economies. Because the products are usually designed for industrial markets, and production scales are small.

Related and Supportive Industries: According to the model, powerful and internationally competitive home-based suppliers can provide cost-effective inputs in an efficient and fast manner. Additionally, such suppliers can contribute to the innovation of these companies with the help of close working relationships and the constant flow of information.

Firm Strategy, Structure, and Rivalry: The individual motivation to work and expand skills is an important factor in creating competitiveness. However, domestic rivalry is the most important stimulating effect on all the other factors. The rivalry should be domestic because it is intensely personal and more motivating. The geographic concentration of the companies operating in the same sector magnifies the strength of domestic rivalry. Domestic rivalry and geographic concentration are the two attributes that can transform the diamond into a system.

Machinery manufacturing companies in Turkey are located in the west and southwest of Turkey. There are three specialized organized industrial zones for machinery manufacturers in Turkey. Two of them are located in Kocaeli, and one of them is in Sakarya. Kocaeli and Sakarya are very close cities in the nearby of İstanbul. These three cities realized 37% of Turkish machinery exports in 2022. So that this industry is neither concentrated nor scattered; in addition, because of the high variety of the products and monopolistic nature of the competition, high and direct rivalry may not be the case.

Most machine manufacturers are SMEs in Turkey (Tuncel and Polat, 2016; Tektas *et al.* , 2008). Kharub & Sharma (2016) observed that competitiveness among manufacturing SME sectors is mainly affected by intangible resources, which are difficult to imitate by competitors, the demand conditions followed by firm strategy, structure, rivalry, and supporting industries. The competitiveness among manufacturing SME sectors is mainly affected by demand conditions followed by firm strategy, structure, and rivalry (Kharub and Sharma, 2016).

The Role of Government: Governments should help national companies to operate in an innovating and competing environment. They shouldn't be directly involved the process. They can focus

on specialized factor creation, limit direct cooperation among industry rivals, enforce strong domestic antitrust policies etc.

Turkish Government seems to promote the indirect supports which Porter advises. In addition to these, especially for the SMEs, there are some direct incentives contributing to the costs of machinery, software, labor and marketing operations. However, those incentives seem to be designed for the early stages of developing a new product, entering a new international market, creating an innovative process etc (KOSGEB, 2023). Among the incentives, “Manufacturing Based Import Substitution Support” takes attention. This incentive provides up to 1,7 million USD, 10 year credits with 6 to 24 months unpaid period (T.C. Sanayi ve Teknoloji Bakanlığı, 2018).

Among these studies which employ the Diamond Model, the one which examines the competitiveness of the Turkish heavy manufacturing industry with Industry 4.0 takes attention. Results show that factor conditions (labor and capital) are the most important aspects which affect the development of Industry 4.0 competitiveness in Turkey (Erboz, 2020).

The primary aim of this research is to discover whether there has been any change in the perceptions of machinery manufacturing companies regarding the barriers to local production of imported goods and procurement of domestic substitutes for imported goods given the COVID-19 disruption. The results will make it possible to comment on the possible change of the nation's competitive position in this industry.

3. Methodology

3.1. Research Design

Case study research is a form of empirical inquiry that investigates a current phenomenon in depth and real life with a single or few units. (Creswell, 2007; Yin, 2018; Miles & Huberman, 1994). While Stake (2005) states that the case study is not a methodology, it is a choice about how to study; Denzin & Lincoln, 2011; Merriam, 1998, and Yin, 2009 suggest that the case study is a comprehensive research strategy. The case study was accepted as the research design in this study. Covid-19 represents a novel phenomenon that has not only altered business operations but also introduced potential future threats. To gain a comprehensive understanding of the attitudes of companies and the context in which these perspectives have developed, a case study design is employed. Moreover, as multiple case studies usually yield more robust, generalizable and testable theory than single-case research (Eisenhardt and Graebner, 2007), 47 companies operating in the machinery sector in Sakarya are analyzed.

The fact that the case study provides an in-depth understanding of the situation under consideration distinguishes it from other research designs. For this reason, the case study in industrial marketing research not only addresses a specific audience but also prepares the ground for questioning. It gives a chance to present new propositions not limited to industrial or business-to-business marketing and may come to the fore as a focus in the future (Farquhar *et al.*, 2020). This study shows that case study research is appropriate in describing the change in the perception of localization in the machinery industry of the pandemic phenomenon that has affected the world.

3.1.1. Sampling

The machinery industry is a leading sector that provides inputs such as investment and intermediate goods to all manufacturing industry sectors (Tuncel and Polat, 2016). It lies at the heart of the production and diffusion of technical change. Advances in processes and products invariably require improved machinery (Fransman, 1986). This industry has particular importance for Turkey due to its

promising export and manufacturing potential (Tektas *et al.* , 2008). It has been the second-biggest exported product group for nearly two decades (Trademap, 2023).

Sakarya province ranks 11th among 81 provinces in Turkey in terms of imports according to 2022 TUIK data (TUIK, 2022). In addition, it is at a strategic point in terms of location for the Istanbul and Kocaeli regions, where the trade volume is intense. Considering all these factors, the study is based on purposeful sampling. The reason for choosing this sample type is that it provides information willingly to understand the study problem and its central phenomenon.

The research population comprises 164 companies that are members of the Sakarya Machinery Manufacturers Association (SAMİB), which gathers the machinery companies in Sakarya under a single roof. After the interviews with the companies in the pre-COVID-19 stage, which is the first part of the study, 47 companies agreed to participate in the research. In the second part of the study, the mid-COVID-19 stage, the number of participating companies decreased to 32.

3.1.2. Data Collection & Coding

Open-ended questions were administered with a semi-structured interview technique to reveal the perceptions of company managers about the obstacles to localization. In the second stage of the study, mid-COVID-19, questions about the experience and expectations of the pandemic were also added.

Questions of the first interview:

1. Who makes the decision to change suppliers in your company? Is it the professional employees or the partners?
2. Are there domestic alternatives to the imported products you purchase?
3. Have you previously conducted research to identify domestic alternatives?
4. When was the last time you conducted research on domestic alternatives?
5. Have you ever tried domestic alternatives? If so, what kind of issues did you face?
6. What might be the underlying reasons for encountering these issues?
7. If not, why did you not try them?
8. Is the imported input a technological product or a raw material?
9. If it is a technological product, have you considered developing it yourself through R&D activities?
10. In your opinion, what barriers exist to the development of an alternative for this product?
11. Do you think that similar products of the same quality can be produced domestically at similar prices to the imported inputs you purchase? Why?
12. Have you considered having your domestic suppliers produce these inputs, or have you made such an offer?

Added Questions in the Second Interview:

1. Have you encountered any issues with your imports during the COVID-19 pandemic?
2. Has the demand for your products from abroad increased during the COVID-19 pandemic?
3. What impact have the pandemic had on your business operations?

The pre-COVID-19 interviews were conducted face-to-face between March and April 2019. The mid-COVID-19 interviews were conducted by telephone between April and May 2020. Face-to-face meetings were not possible for the second stage of interviews due to the curfew and intercity transportation restrictions in Sakarya due to the pandemic. All interviews were conducted by a single interviewer. Prior to the interviews, participants were informed about the scope and purpose of the study.

With their consent, audio recordings of the interviews were made. These recordings were later transcribed.

The transcription process of the audio recordings obtained with the consent of the participants was completed. Themes and codes were created through the open coding method using an inductive approach. The details about the theme and codes are quoted in Figure 1.

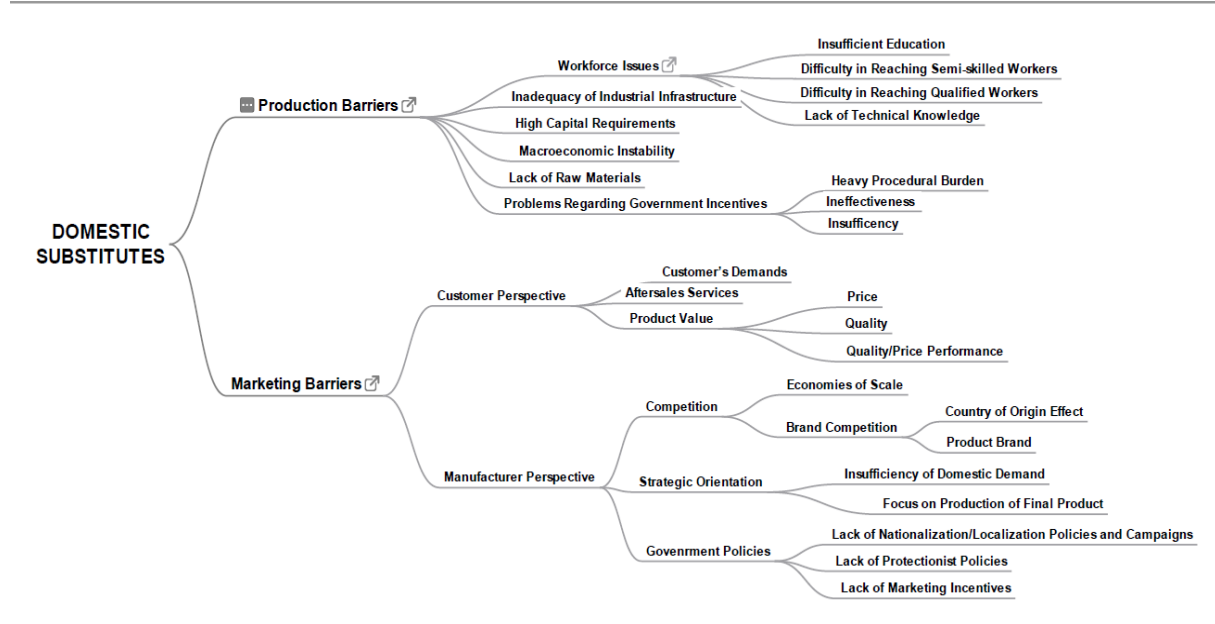


Figure 1. Mapping of Production and Marketing Barriers

3.2. Analysis

Content analysis is included in the literature as quantitative/syntax and qualitative/semantic analysis. The semantic dimension of content analysis considers the meaning of the content and forms the qualitative part of the content analysis. Semantic content analysis can analyze the meaning of a word, sentence, paragraph, or text. The syntax dimension, on the other hand, is based on the frequency of the content and forms the quantitative part of the content analysis (Gokce, 2006). Qualitative/semantic content analysis was used in this study.

The interview data were analyzed using MAXQDA, a qualitative analysis software program. The software enables data monitoring, adding new codes, and editing the codes throughout the analysis process.

4. Results

The analysis consists of two stages. Respectively, the perceptions of companies as obstacles to localization in the pre-COVID-19 stage; in the mid-COVID-19 stage, it was analyzed whether the pandemic process caused a change in their perceptions. The results obtained are evaluated in the context of Porter's diamond model at the end of this section.

4.1. Pre- COVID 19 Stage

When evaluating the participants' responses, we first explored their experiences regarding the domestic production of imported goods and local procurement of domestic substitutes. About one-third of the participants stated that domestic substitutes exist for their imported products. Before the COVID-19 pandemic, nearly half of them had tried to diversify their overseas suppliers, and one-third had created

initiatives to locally produce the products they had previously obtained from abroad. These are all proactive strategies.

| | | |
|---------------------|--|---|
| Production Barriers | Workforce Issues | Insufficient Education |
| | | Difficulty in Reaching Semi-skilled Workers |
| | | Difficulty in Reaching Qualified Workers |
| | | Lack of Technical Knowledge |
| | Inadequacy of Industrial Infrastructure | |
| | High Capital Requirements | |
| | Macroeconomic Instability | |
| | Lack of Raw Materials | |
| | Problems Regarding Government Incentives | Heavy Procedural Burden |
| | | Ineffectiveness |
| | | Insufficiency |

Next, we analyzed the perceptions of the participants regarding localization barriers. Both interviews were used to develop a general picture of the context. This analysis revealed that the participants considered the concept of localization barriers from two essential perspectives. Firstly, they identified barriers to the domestic production of imported goods. However, even if those barriers are overcome, they still perceive some marketing barriers. Therefore, the marketing and production barriers must be reduced to enable such an initiative.

Barrier Perceptions Regarding Production of Domestic Substitutes of Imported Goods:

Table I outlines the themes and codes identified regarding the perceived barriers against using domestic substitutes for imported products by the companies themselves or their suppliers.

Table I. Production Barriers

One of the barriers perceived by the participants regarding the production of domestic substitutes related to **the workforce**. The participants discussed the difficulties that they had experienced in recruiting staff, especially qualified engineers and intermediate-level staff. In 2020, the median age in Turkey was 32.7 (TUIK, 2022), and the average unemployment rate was 13.2% (TUIK, 2022). Therefore, although there are many young job-seekers, this workforce needs to be adequately skilled. Further, the desire of university graduates to work in jobs for which they are qualified creates difficulties in finding intermediate-level staff. As one participant said,

“...the industry is about to collapse. It will collapse in 4-5 years if we cannot raise intermediate staff.”

Regarding the **inadequacy of industrial infrastructure**, the participants stated that their companies need specially designated industrial zones for SMEs. As one participant said,

“...SME budgets are insufficient to invest in existing organized industrial zones.” Likewise, the other said: *“I want to take part. One million TL is requested for one decare. How can I find this money?”*

High capital requirements were also commonly cited as a barrier, as all the participating companies were SMEs. Stainless steel, the sector's main input, was often referred to. As one participant said,

“...we are completely dependent on abroad for aluminum and stainless steel in the aerospace and defense industry. How can we produce if we cannot get them?” Another participant said, *“... There are key products such as stainless steel. Our exports may increase if these key products are produced in our country.”*

Although there is steel production in Turkey, stainless steel production requires an additional investment which is very high even for the multinational companies.

Research and development, production, brand promotion, and the creation of marketing channels are all processes that require time and capital. However, since Turkey is a developing country, its economy is fragile. For this reason, the participants perceived the investments in developing new products ver risky. As one participant said,

“... You cannot foresee anything in Turkey; you cannot plan. There is a crisis, and you cannot buy materials. Nobody produces it because they cannot sell it. Some companies with crisis predictions stops producing; this time, you go abroad, and there is no such volatility abroad. Despite all that, we are trying to invest”.

The companies that referred to high capital requirements were distancing themselves from new investments due to the economic crisis and fluctuations in the exchange rate. According to World Economic Forum Global Competitiveness Index, Turkey ranks 129th in the world for **macroeconomic stability**. Thus, the perceptions of the participants reflect the current situation in Turkey.

Another barrier reported by the participants is the need for more availability in Turkey of the **raw materials** of some products, including magnets and chrome. Thus, the production of domestic substitutes may be costly, even if possible.

The firms wished to benefit from **government incentives** for developing domestic substitutes, but they perceived some obstacles. Some companies considered government incentives to be insufficient. Others suggested that the incentives could be more effective because they are unsuitable for the purpose and involve burdensome procedural requirements. As one participant noted,

“...They asked me to fill a form like an epic, and they say we must write five pages. I am thinking, am I a mechanic or a writer?... The procedures in incentives are not result-oriented and are too long.”

Barrier Perceptions Regarding Marketing of Domestic Substitutes of Imported Goods: In the interviews, the companies mentioned more marketing barriers than production barriers. Some participants stated that they did not see any obstacles to production; if such obstacles existed, they could be overcome with government support. The main problem for the participants was the sale of manufactured products.

When asked about the marketing of domestic substitutes, the companies answered from the perspectives of two different roles: customer and manufacturer. From their customer perspective, the firms expressed why they did not prefer existing or potential domestic counterparts, whereas, from their perspective as manufacturers, they mentioned the perceived obstacles to selling the products they produce or can produce. For this reason, the themes distinguish between the consumer's and manufacturer's answers. Table II outlines the themes and codes identified regarding the perceived barriers to the sale of domestic substitutes for imported products by the companies themselves or their suppliers.

| Customer Perspective | | | Manufacturer Perspective | | |
|--|---------------------------|--|--------------------------------|---|--------------------------|
| Customer's Demands | | | Competition | Economies of Scale | |
| Product Value | Price | | | Brand Competition | Country of Origin Effect |
| | Quality | | | | |
| | Quality/Price Performance | | Strategic Orientation | Insufficiency of Domestic Demand | |
| Focus on the Production of the Final Product | | | | | |
| Aftersales Services | | | Government Policies | Lack of Nationalization/Localization Policies and Campaigns | |
| | | | Lack of Protectionist Policies | | |
| | | | Lack of Marketing Incentives | | |

Table II. Marketing Barriers

Customer Perspective: As shown in Table II, the participants who preferred not to use domestic substitutes for imported products were grouped under three principal codes. Most participants who referred to these issues were speaking based on their experiences. Although the participants expressed an intention to buy domestic substitutes, they preferred not to due to the inadequacy of the after-sales service, their customers' direct demands for imported intermediate inputs and the inferior price and quality of domestic products compared to imported products.

Customer demand refers to the situation in which the participants' customers requested brand-name products for certain parts, particularly concerning the engine. In this situation, the companies were obliged to use imported products or lose their customers to a competitor. Thus, the manufacturers did not evaluate domestic substitutes in such situations.

In contrast, the participating companies did compare the imported products and their domestic substitutes in the product value item. However, they preferred the imported products due to their higher quality, as reflected in the most frequently cited sub-code. Most companies that used or intended to use domestic substitutes claimed that the substitutes were of lower quality than imported products and could not meet the industry's quality standards. One participant noted,

"...our rails need to be like linear arrows. However, we get samples that draw 8," while another said, "We were able to use only 50 of the 100 encoders we purchased. The underlying reason for this is faulty design and poor quality of the products."

In addition, although the price was not mentioned as often as quality, some companies reported that domestic substitutes were more expensive. They stated they needed to place orders in high volumes to get lower prices, but they could not make orders of this scale.

The last code evaluated under the product value theme was **after-sales service**. Since most of the domestic equivalents were produced by SMEs, the need for an extensive international technical service provider network and low local service quality in the domestic country were two critical obstacles. When referring to the poor after-sales service code, the participants evaluated the service they had received for their purchased domestic capital goods. They felt that when they selected domestic capital products, and those products malfunctioned, the manufacturer did not show due diligence. As one participant said,

"...production is not the biggest problem; component to prove itself in the international market. We produce Turkish products, and we are trying to market them. If your competitor is using Siemens, it is a negative reference for my customer if I use a product that no one, produced in Turkey know, or that has no service when it has an accident in New Zealand".

On the other hand, for intermediate goods to be used in production, the companies mainly evaluated the convenience of accessing the technical services requested by their customers, particularly their foreign customers. If a product malfunctions and there is no service available for that product abroad, it is very costly and challenging for the Turkish company to provide support. For example, suppose a Siemens engine is used in the machinery. In that case, Turkish SMEs can easily export the product because any problems related to the engine can be solved by Siemens' network of technical services providers. However, if the engine manufacturer is a domestic company, it is challenging and costly to solve problems remotely.

All participants stated that they would prefer local substitutes if all these obstacles were eliminated. One participant was even willing to pay a higher price, considering the supply advantage, if the domestic equivalent was the same quality as the imported product.

Manufacturer Perspective: From their perspective as manufacturers, the participants discussed the obstacles they might encounter while marketing domestic substitutes for imported products. The principal codes in this theme were competition, state policies, and strategic orientation, with **competition** being the most frequently cited. The participants stated that the products they imported were relatively well-established brands with which it was impossible to compete. They were concerned that they would not be able to market their products effectively in domestic and foreign markets, especially because of the importance of the country of origin in the machinery sectors of Germany, Italy, and the US, together with the high recognition of brands based in those countries. As one participant stated,

“Siemens has been around for 100 years. It has given Programmable Logic Controller (PLC) systems to all universities worldwide for 60 years. All those who graduated from those universities know about Siemens. You cannot compete with this brand.”

Companies must compete with high-quality, well-established brands and low-priced Chinese products of reasonable quality. The latter type of products is widely accepted in the global market due to their economies of scale.

The product-based national competitive advantages of Germany, China, the US, and Italy are all superior to that of Turkey. In 2019, the Revealed Comparative Advantage (RCA) for each country in the machinery sector was > 1 (Germany = 1.42; China = 1.41; USA = 1.06; Italy = 1.52), meaning that they are competitive in the global market. In the same year, Turkey's RCA was 0.82, which is not competitive in this sector. Therefore, the secondary data supports the concerns expressed by enterprises.

The participants reported that they were required to reach a specific sales volume to produce products similar to the quality and prices of imported products. However, due to the **low volume of domestic demand**, production should be planned directly for the global market. However, SMEs perceived initiating such an international investment as high risk. One participant noted:

“One should refrain from investing by targeting only the domestic market. Your export market will exist. Nevertheless, the domestic market will be the locomotive for you. In this sense, trying to meet the demand shortage from foreign markets seems risky.”

Most participants considered that Turkey's domestic market does not have sufficient actual or potential demand for their investments to be profitable. Another participant stated,

“There is an obstacle to reaching profitable pieces. It does not make much sense to invest before reaching those numbers. There is a vicious circle.”

For these reasons, some companies prefer to differentiate their final products rather than produce domestic equivalents of existing products. One participant noted,

“Of course, I can copy. However, there is no point in re-discovering America. We need to add value to it.”

Most participating companies mentioned that they required **government support** for domestic market substitutes, the domestic market initially, and later in the international markets. However, they claimed that these supports were not sufficient. First, they stated that the procurement of domestic products should have been encouraged, and the state should take the lead in this area. They emphasized that the government should create campaigns to procure domestic inputs and products and prioritize domestic products in public procurement. Additionally, some companies proposed that the government impose measures against imports, such as customs duties or non-tariff barriers. However, others stated that implementing such measures would not provide a solution. For example, one participant noted:

“There have been many companies in Turkey that set out with the desire to produce domestic products and put obstacles in front of imports. Moreover, they could not produce that product. Since it could not produce, that product entered the country at very high prices.”

Meanwhile, a second participant stated:

“We should have produced. For the last 15 years, Turkey has been an import paradise. When we returned a few years ago, the dollar and the euro were meager. That is why everything was imported. For this reason, the domestic manufacturer is not in a position to produce. Many of them went bankrupt.”

Another area where participants requested additional government support was brand creation in terms of their products and national brands. Developing countries with global brands were cited as examples. One participant noted,

“As long as you have some product, you can have a say in the world. For example, today, South Korea has two brands: Hyundai and Samsung. Nevertheless, the country is almost at the level of Germany today.”

4.2. Mid- COVID 19 Stage

This section first describes the changes in the participants' ways of making business and operations and consumer demand for supplies from abroad before and during the COVID-19 pandemic. Secondly, the changes in participants' perceptions of the barriers to localization are outlined.

Two-thirds of the participants stated that they had experienced problems with their imports, while the remaining one-third had not. A quarter of the participants preferred maintaining their stock as a reactive strategy, foreseeing shipping problems due to the ongoing pandemic.

About half of the participants stated that the demand for their products had increased during the pandemic period, while the other half had observed a decrease. These variations may have been caused by the differences in the kinds of products produced by the companies. For example, the demand for packaging machines increased while the demand for timber processing machines decreased.

Most participants suggested that digitalization and remote working were the leading structural changes caused by the pandemic. Other changes, expected to continue after the pandemic, included an increased focus on the productivity of operations, hygiene measures, the creation of flexible supply chains, increased demand for domestic substitutes, and an orientation towards automation.

Changes in Perceptions of Barriers to the Production of Domestic Substitutes for Imported Goods:

The second stage of interviews mentioned the production barriers emphasized in the first stage (i.e., high capital requirements, workforce issues, and problems related to government incentives). However, during the second stage, government incentives were more commonly raised. This indicates that companies' expectations of government assistance have increased during the pandemic. While the participants emphasized the ineffectiveness of government incentives in the pre-COVID-19 interviews, in the second stage of interviews, they emphasized the insufficiency of such incentives, suggesting that companies now expect additional incentive programs due to the pandemic from the government.

In the pre-COVID-19 interviews, the participants discussed the difficulties of recruiting semi-skilled and qualified workers and the gaps in workers' education. During the pandemic, the participants emphasized deficiencies in technical knowledge. Perhaps due to downsizing or the widespread use of remote work, problems related to recruitment have become less important.

The participants in the second stage barely mentioned the macroeconomic instability discussed in the first stage of interviews. This may be because the pandemic has caused companies to orient their

efforts toward short- and medium-term issues rather than longer-term ones. Likewise, the inadequacy of industrial infrastructure discussed during the first stage should have been mentioned in the second.

Changes in Perceptions of Barriers to the Marketing of Domestic Substitutes for Imported Goods:

Manufacturer Perspective: No significant changes were observed in the principal codes between the first and second stages of interviews.

In both stages, companies identified competition as the most critical barrier to marketing domestic substitutes for imported products. While the first stage of interviews emphasized brand competition, participants in the second stage identified competition arising from economies of scale as an important barrier. In other words, competition on the price-cost axis became more important during the pandemic.

When the competition barrier is evaluated together with the sub-dimensions of product and country competition, the emphasis on competing with global brands that were present in the first stage of interviews was not observed in the second stage. The emphasis shifted from brand competition to country competition. This macro focus is due to the global nature of the pandemic. For example, all companies have experienced problems importing products, regardless of the brand. As of the second stage of interviews, Turkey had stopped the flights to and from Italy, China, Germany, and France, all of which included suppliers of the participants. Additional precautions applied at the Turkish borders also slowed the flow of goods. As a result, most global brands in the domestic market were in a difficult situation regarding their customers.

The data on perceptions of barriers related to government policies indicated that the emphasis has increased on solvable problems in the short term. For instance, while the requirement to prefer domestic products in public procurement was the least cited government policy code in the first stage of interviews, it was the most emphasized code in the second stage. This suggests that companies need strong guarantees, such as the government purchase guarantee, to make the necessary investment in production during the pandemic. The participants perceived investing during the pandemic period as risky due to the economic contraction in Turkey.

Although deficiencies in protectionist policy were the most frequently mentioned code in the first stage of interviews, this code was mentioned less in the second stage. This indicates that the importance of obtaining the necessary products in any way possible during the pandemic has increased.

The lack of government campaigns concerning nationalization or localization policies, frequently mentioned during the first stage of interviews, should have been mentioned in the second stage. This situation may be because the government has been focused on responding to the pandemic. Another reason may be that such campaigns are a longer-term solution and may not provide enough confidence in the short term.

Finally, insufficient domestic demand and final product development were referred to in both stages of interviews. However, the emphasis shifted from insufficient domestic demand in the first stage to final product orientation in the second stage. This suggests that due to the disruption of international marketing activities and operational processes caused by the pandemic, companies have placed more importance on the domestic market during this period.

Customer Perspective: Some companies that mentioned that they had not considered using domestic substitutes before the pandemic declared that they had begun to consider using such substitutes during the pandemic.

Product value was the most significant barrier to procuring domestic substitutes in both stages of interviews. Although the quality was the most crucial reason for the participants' preference for imported goods over domestic substitutes in both interviews, the price issue gained importance during the pandemic. In the first stage, some participants stated that they preferred imported goods over domestic substitutes due to the availability of after-sales services. However, this factor should have been mentioned in the second stage. Instead, participants focused on the price paid for rather than the benefit obtained from the purchased product. This may be due to financial difficulties and customer demand decrease. Many participants in the first stage of interviews stated that customers had requested specific brands, but this precondition should have been mentioned in the second stage. This further suggests that the change in emphasis was due to the decrease in orders.

4.3. Reevaluation of the Results within the Scope of the Diamond Model

The results of the study are reorganized according to the determinants of the Diamond Model in Table III. The comments part includes both the data obtained from the interviews and results of the previous related literature, regarding Turkish machinery manufacturing industry.

All the factors which were obtained by open-coding technic have a place in the Diamond Model, excluding “competition and its subcodes” and “macroeconomic instability”. Lack of competition is comprehensible. Because, competition is the aim of the Diamond Model, rather than being a discouraging marketing obstacle. However, macroeconomic stability seems to be a requirement to invest new product developments.

| Diamond determinants | Sub-dimension of the determinant | Comments |
|--|----------------------------------|---|
| Factor conditions | Industrial Infrastructure | IOZs exist, but their number needs to be increased, and they are hardly reachable by SMEs because of inadequate capital. |
| | Raw Materials | Stainless steel is a common input for all companies. Although Turkey has minerals, stainless technology does not exist in Turkey and requires high capital to invest. |
| | Labor | There is a need for highly skilled and semi-skilled employees. University education needs to be improved, and there are no supporting institutes. |
| | Technology | No barriers are perceived in the case of technology. |
| | Capital | Stainless steel is a common input in the industry. Although Turkey has minerals, manufacturing stainless steel requires a high capital investment that most big companies cannot afford alone. |
| Demand Conditions | Market sophistication | Mostly, products are designed in according to the directions of customers. Most of the companies are exporting; they are also in contact with international buyers. |
| | Market Size | Domestic market size is not sufficient to be competitive. International markets also should have been targeted for new products to be competitive in price. |
| | After-Sales Service Network | Because of the technical requirements after the sale, customers need to reach the services efficiently. Global after-sales service network requires high capital investments, which SMEs can not afford. |
| Related and Supporting Industries | Clustering | Only some of the machinery manufacturers in Turkey are concentrated in a specific region. The study sample is in the most clustered part but not in IOZs. The sample companies mentioned neither cooperation nor competition. |

| | | | |
|--|---|--|--|
| Firm Strategy, Structure, and Rivalry | Firm Strategy | | Most companies prefer to focus on their final product rather than producing their components. None of them showed the desire to produce local alternatives to imported goods. However, some of them had past experiences. |
| | Firm Structure | | All of them are SMEs. So that making decisions can be easy and fast. They are supposed to be more flexible than big companies. |
| | Rivalry | | The structure of the competition is global and monopolistic. Their customers demand the components, especially the engine, with the brands of multinational established companies. None of them mentioned anything about domestic competition. This can be because of the niche segments dominating the market structure. |
| Diamond determinants | Sub-dimension of the determinant | | Comments |
| The Role of Government | MARKETING | Lack of Nationalization /Localization Policies and Campaigns | Most of the companies seem to expect direct marketing incentives. Even, some of them mentioned government purchasing guarantee. These types of incentives hurt companies in the long run according to Porter (1990). |
| | | Lack of Protectionist Policies | |
| | | Lack of Marketing Incentives | |
| | PRODUCTION | Heavy Procedural Burden | Procedures results from Turkish Government's precautions against the misuse of the funds provided. Not cooperating with project consulting companies may have created this perception by SMEs. |
| | | Ineffectiveness | |
| | | Insufficiency | |
| | | | |

Table III: Reevaluation of Results from the Porter Diamond Model Perspective

5. Conclusion

Turkish machinery manufacturing industry seems to be on the way to being competitive. Because of the perceived marketing and production barriers, the companies do not show enthusiasm for producing or buying the local alternatives of imported goods. Even the pandemic did not change this view. Oppositely, the general impression is protecting what they have and surviving until the crisis is over. As a result, the pressure and challenge of the shortcomings in their supply chain were not evaluated as a source of advantage to be competitive, as Porter (1990) guesses. However, Porter's two vital elements, "domestic rivalry and geographic concentration" seems not to be matured in this industry. The reason why COVID-19 supply chain disruption isn't evaluated as a disadvantage to be an opportunity can be the missing points in the system.

Apart from Porter's (1990) Diamond Model's determinants of competitiveness, "time" seems to be an input of being competitive. To produce a globally competitive product, companies need time to provide acceptable quality at reasonable prices. They think they should perfect the quality and take advantage of economies of scale. They need time for these. Under the macroeconomic instability survived by most of the developing countries like Turkey, investing in an area that takes time to reach the break-even point seems to be too risky. "Global competitors operating in the industry are established companies which were founded at least three decades ago." is the sentence that the companies mentioned

several times. In addition, our sample seems to attach more importance to domestic market size than Porter (1990) did. Either Porter (1990) underestimated or our sample exaggerated, or some of both.

5.1. Managerial Implications

From the manufacturer and customer perspectives, companies' perceptions of marketing barriers were similar between the first and second stages of interviews. In both stages, the most prominent factor from the manufacturing perspective was competition, including brand competition and economies of scale. On the customer side, problems related to product value, quality, and after-sales services were among the barriers to procuring domestic substitutes.

The scale of SMEs appears to hinder their ability to compete in international markets. In order to be competitive abroad with new products, they must first match the quality of products offered by global companies and subsequently achieve a sufficient sales volume to benefit from economies of scale. However, since domestic demand alone is insufficient to ensure economies of scale, SMEs should target international markets when developing new products.

One potential strategy to secure the necessary resources is clustering. However, for such clustering to be effective, it should focus on marketing and after-sales services in foreign markets rather than production at the local level. Given the highly diverse range of products within the machinery industry, local-level clustering is unlikely to yield the desired outcomes. Due to this fragmented structure, a viable solution could be the establishment of shared offices in target countries, where firms producing similar or identical products at the national level could collaborate in marketing and after-sales services.

Within this framework, the government could develop incentive programs to facilitate the organization of firms. Another form of government support could involve prioritizing local firms in public procurement processes. Although incentive mechanisms often favor local brands, the implementation of such preferences in public procurement appears to be left to the discretion of decision-makers. Although Porter (1990) does not explicitly recommend direct incentives, he acknowledges that such incentives can be effective in the early stages of an industry's growth.

In addition to public institutions, business associations and federations can actively contribute to this process. However, firms' willingness to invest in this area appears to be contingent upon economic stability. Enterprises that are primarily focused on short-term survival under current conditions demonstrate limited inclination toward making long-term investments.

These results illustrate that machinery manufacturers perceive many barriers to producing, marketing, and procuring domestic substitutes for imported products. Solving many of these problems will require time, cooperation, government support, and a clear overarching strategy. There were few changes in the perceived barriers in the interviews conducted before and during the pandemic. However, in the second stage of interviews, the companies focused on the barriers that could be eliminated relatively quickly.

5.2. Limitations and Future Research

The primary and most significant limitation of the study is the difference in the methods used for the first and second interviews. In addition to the necessity of conducting the second interviews over the phone due to pandemic-related constraints, participants were reluctant to answer the questions and share their ideas in detail during the second round of interviews.

Given that this research only dealt with machinery manufacturers in Sakarya, there is an opportunity for further research in the future to examine the effects and perceptions of barriers to domestic substitutes in different sectors and regions. Because machinery sector is a matured sector. Products which are in the introduction or growth stages, time may not be a barrier. Additionally, SMEs are usually financially constrained enterprises. Bigger companies may have more courage to compete with the global counterparts.

As the nature of the case study, the findings can not be generalized. With the support of this study, a quantitative scale can be developed and applied to a bigger sample with a quantitative approach to reach generalizable results.

6. Declarations

6.1. Competing Interests

There is no conflict of interest in this study.

6.2. Authors' Contributions

Authors declare that they have contributed equally to the work.

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Kesirli Diferensiyel Denklemlerle Finansal Problemlerin Matematiksel Analizi ve Çözüm Yöntemleri

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ÖZ

Finansal problemlerin analizi ve çözümü, geleneksel matematiksel yöntemlerin sınırlarını zorlayan karmaşıklıklar içerir. Özellikle finansal piyasalarda gözlemlenen volatilité, alışkanlık etkileri ve uzun vadeli bağımlılıklar gibi özellikler, klasik diferensiyel denklemlerle modellemede yetersiz kalabilir. Bu bağlamda, kesirli diferensiyel denklemler, finansal matematiğe yeni bir yaklaşım sunarak bu tür karmaşık süreçleri daha etkili bir şekilde temsil etme potansiyeline sahiptir. Kesirli hesaplama, türev ve integral işlemlerinin tam sayı olmayan mertebeleriyle çalışarak, kolayca sınıflandırılmayan yayılma süreçlerini modelleme imkanı sağlar. Bu özellikler, finansal sistemlerdeki uzun vadeli bağımlılıkları, geçmiş olayların mevcut durumlara etkisini ve piyasaların karmaşık doğasını daha doğru bir şekilde açıklamak için güçlü bir araç sunar. Bu çalışmada, kesirli diferensiyel denklemlerin teorik temelleri ele alınarak, bu denklemlerin finansal problemlerdeki uygulanabilirliği incelenmiştir. Özellikle volatilité analizi, opsiyon fiyatlandırma, risk yönetimi ve portföy optimizasyonu gibi temel finansal alanlarda kesirli modellerin sunduğu avantajlar tartışılmıştır. Geleneksel Black-Scholes modelinin kesirli versiyonu gibi spesifik uygulamalar, piyasaların daha gerçekçi bir şekilde modellenmesini mümkün kılarak bu yöntemlerin potansiyelini göstermektedir. Ayrıca, finansal verilerin kesirli zaman serisi analizine tabi tutulması, kolayca sınıflandırılmayan yayılma süreci piyasa davranışlarının daha iyi anlaşılmasını sağlamaktadır. Çalışmada aynı zamanda, kesirli denklemlerin çözümünde kullanılan analitik ve nümerik yöntemlerin literatürünü de içermektedir. Sonlu fark yöntemleri, spectral yaklaşımlar ve Grünwald-Letnikov tekniği gibi nümerik yöntemler, kesirli denklemlerin çözümünde kritik bir rol oynar. Bunun yanı sıra, yapay zeka destekli algoritmaların, finansal verilerden öğrenerek daha etkili çözümler sunma potansiyeline sahip olduğu vurgulanmıştır. Ancak, kesirli diferensiyel denklemlerin çözümünde karşılaşılan zorluklar bu alanda daha fazla çalışmaya ihtiyaç duyulduğunu göstermektedir. Gelecekte, daha gelişmiş hesaplama yöntemlerinin ve veri odaklı yaklaşımların entegrasyonu ile bu modellerin finansal matematikteki rolü daha da artacaktır. Sonuç olarak bu çalışmayla, kesirli diferensiyel denklemlerle finansal problemlerin çözümüne yönelik yapılmış ve geliştirilmeye aday çalışmaların teorik, uygulama ve araştırma alanları sunulmaya çalışılmıştır.

Anahtar kelimeler: Kesirli diferensiyel denklemler, finansal matematik, matematiksel modelleme, nümerik yöntemler, volatilité analizi.

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Cite as: Can, E. (2025). Kesirli Diferensiyel Denklemlerle Finansal Problemlerin Matematiksel Analizi ve Çözüm Yöntemleri. *Journal of Business and Trade*, 6(1), 56-67. <https://doi.org/10.58767/joinbat.1601559>

Mathematical Analysis and Solution Methods for Financial Problems with Fractional Differential Equations

ABSTRACT

The analysis and solution of financial problems involve complexities that challenge the limits of traditional mathematical methods. Especially in financial markets, characteristics such as volatility, memory effects, and long-term dependencies can be insufficiently modeled by classical differential equations. In this study, fractional differential equations offer a new approach to financial mathematics, with the potential to represent such complex processes more effectively. Fractional calculus, by working with non-integer orders of differentiation and integration, provides the ability to model diffusion processes that cannot be easily classified. These features provide a powerful tool to more accurately explain long-term dependencies in financial systems, the impact of past events on current situations, and the complex nature of markets. In this work, the theoretical foundations of fractional differential equations are addressed, and the applicability of these equations in financial problems is examined. In particular, the advantages of fractional models in fundamental financial areas such as volatility analysis, option pricing, risk management, and portfolio optimization have been discussed. Specific applications such as the fractional version of the traditional Black-Scholes model demonstrate the potential of these methods by enabling a more realistic modeling of the markets. Additionally, subjecting financial data to fractional time series analysis facilitates a better understanding of market behaviors with diffusion processes that are not easily classified. The study also includes a review of the literature on the analytical and numerical methods used in the solution of fractional equations. Numerical methods such as finite difference methods, spectral approaches, and the Grünwald-Letnikov technique play a critical role in the solution of fractional equations. In addition, it has been emphasized that AI-supported algorithms have the potential to offer more effective solutions by learning from financial data. However, the challenges encountered in solving fractional differential equations indicate that more research is needed in this area. In the future, with the integration of more advanced computational methods and data-driven approaches, the role of these models in financial mathematics will further increase. As a result, this study aims to present the theoretical, practical, and research areas of works that have been conducted and are candidates for further development in solving financial problems with fractional differential equations.

Keywords: Fractional differential equations, financial mathematics, mathematical modeling, numerical methods, volatility analysis.

1 Giriş

Finansal sistemler, doğası gereği karmaşık, belirsizliklerle dolu ve dinamik yapılardır. Bu sistemlerin, bireysel yatırımcı davranışlarından makroekonomik değişkenlere kadar geniş bir yelpaze altında etkileri vardır. Özellikle finansal piyasalarda meydana gelen fiyat dalgalanmaları, volatilité hareketleri, risk ve likidite gibi unsurlar, finansal problemlerin matematiksel olarak modellenmesini hem zorunlu hem de oldukça zorlu bir alan haline getirmiştir. Bu zorluklar, finansal sistemlerin içsel dinamiklerinin daha iyi anlaşılması ve yönetilmesi için yenilikçi matematiksel yaklaşımların geliştirilmesini gerekli kılmıştır. İşte bu noktada kesirli diferensiyel denklemler, finansal matematikte giderek daha fazla ilgi gören bir araç olarak öne çıkmaktadır.

Kesirli diferensiyel denklemler, türev ve integral işlemlerinin tam sayı olmayan mertebelerini ele alarak, klasik diferensiyel denklemlerin ötesine geçen bir analiz çerçevesi sunar (Podlubny, 1999; Kilbas et al., 2006). Geleneksel diferensiyel denklemler, genellikle doğrudan ilişkileri ve kısa vadeli bağımlılıkları modellemek için uygundur. Ancak finansal piyasalar, yalnızca kısa vadeli etkilerle sınırlı kalmayan, uzun vadeli bağımlılıkları, davranış etkilerini ve piyasanın normal dışı yayılma süreçlerini içeren karmaşık bir yapıya sahiptir. Kesirli hesaplama, bu tür uzun vadeli bağımlılıkları ve yayılma süreçlerini daha etkili bir şekilde modellemek için uygun bir matematiksel çerçeve sağlar (Mandelbrot, 1963; Hurst, 1951). Özellikle volatilité analizi, finansal zaman serileri ve risk yönetimi gibi alanlarda kesirli modellerin kullanımı, finansal sistemlerin daha gerçekçi ve ayrıntılı bir şekilde anlaşılmasını mümkün kılmaktadır.

Finansal matematikte klasik diferensiyel denklemler, özellikle Black-Scholes modeli gibi yaklaşımlar aracılığıyla önemli bir etki yaratmıştır. Black-Scholes modeli, opsiyon fiyatlandırma alanında devrim yaratan bir araç olarak öne çıkmış ve finansal ürünlerin değerlemesinde bir standart haline gelmiştir. Bununla birlikte, bu modelin belirli sınırlamaları olduğu da iyi bilinmektedir. Örneğin, piyasa volatilitesindeki oynaklık, geçmiş olayların mevcut fiyatlamalara etkisi ve piyasalardaki normal dışı hareketlilikler, Black-Scholes modeli tarafından tam olarak yakalanamamaktadır (Cont, 2001; Cartea ve del-Castillo-Negrete, 2007). Kesirli Black-Scholes modeli, bu sınırlamaları ele alarak, piyasa davranışlarının daha doğru bir şekilde modellenmesini sağlayan bir genişleme sunar. Özellikle volatilité dinamiklerini ve bellek etkilerini içeren bu model, geleneksel modele kıyasla piyasa verileriyle daha uyumludur.

Kesirli diferensiyel denklemler, yalnızca teorik bir araç olmanın ötesine geçerek, finansal piyasalarda uygulamalı bir çözüm sunar. Volatilité modellemesinde bellek etkilerinin dikkate alınması, piyasalardaki normal dışı davranışların daha iyi anlaşılmasını sağlar. Örneğin, uzun vadeli bağımlılık ve Hurst üssü gibi kavramlar, finansal zaman serilerinin kesirli bir yaklaşımla analiz edilmesini mümkün kılar. Bu tür analizler, sadece finansal piyasalarda değil, aynı zamanda ekonometrik modelleme, portföy optimizasyonu ve risk yönetimi gibi alanlarda da etkili sonuçlar doğurur (Metzler ve Klafter, 2000). Kesirli modeller, piyasalardaki belirsizlikleri ve dalgalanmaları modelleyerek, yatırımcılar ve politika yapıcılar için daha etkili stratejiler geliştirilmesine olanak tanır.

Bu çalışmanın amacı, kesirli diferensiyel denklemlerin teorik temellerini açıklamak, bu modellerin finansal problemlerdeki uygulanabilirliğini değerlendirmek ve çözüm yöntemlerini detaylı bir şekilde ele almaktır. Çalışmada, kesirli denklemlerin finansal matematikteki rolü, teorik temel, pratik uygulama ve çözüm yöntemleri olmak üzere üç ana eksen etrafında incelenmiştir.

Kesirli diferensiyel denklemlerin çözümü, analitik yaklaşımlar kadar nümerik yöntemlerle de zenginleşmiştir. Sonlu Farklar yöntemi, spectral yaklaşımlar ve Grünwald-Letnikov tekniği gibi nümerik yöntemler, bu denklemlerin çözümünde önemli bir yere sahiptir. Ayrıca, yapay zeka destekli algoritmaların ve veri odaklı yaklaşımların kesirli modellerin çözümüne entegrasyonu, bu alandaki araştırmalara önemli katkılar sağlamıştır (Cartea ve del-Castillo-Negrete, 2007). Ancak, kesirli diferensiyel denklemlerin çözümünde karşılaşılan hesaplama zorlukları, bu alanda daha fazla çalışmaya ihtiyaç duyulduğunu göstermektedir.

Dolayısıyla kısaca bu çalışmada, kesirli diferensiyel denklemleri finansal matematik bağlamında detaylı bir şekilde incelenmeye çalışılmış, bu modellerin finansal sistemlerin dinamiklerini anlamada nasıl kullanılabileceğinin gösterilmesi amaçlanmıştır. Çalışmanın bundan sonraki bölümlerinde sırasıyla; ilk olarak, kesirli diferensiyel denklemlerin matematiksel altyapısı ve finansal problemlere uygulanabilirliği tartışılmış, daha sonra, finansal piyasalardaki belirli uygulama alanları, özellikle volatilité modellemesi, opsiyon fiyatlandırma ve risk yönetimi gibi başlıca konular ele alınmıştır. Son olarak da, kesirli denklemlerin çözümünde kullanılan analitik ve nümerik yöntemler üzerinde durulmuştur.

2 Kesirli Diferensiyel Denklemlerin Teorik Temelleri

2.1 Kesirli Hesaplamanın Tanımı ve Kapsamı

Kesirli hesaplama, türev ve integral işlemlerinin tam sayı olmayan mertebelerde uygulanmasıyla ilgilenen matematik dalıdır. Bu alan, klasik diferensiyel denklemlerin sunduğu sınırların ötesine

geçerek, alışkanlık etkileri, sistemin geçmiş durumlarına bağımlılık gibi özellikleri modellemeyi mümkün kılar. Kesirli türevler ve integraller, normal dışı yayılma, alışkanlık etkileri ve uzun vadeli bağımlılık gibi süreçlerin modellenmesi için ideal bir araçtır (Podlubny, 1999; Kilbas et al., 2006).

Kesirli hesaplamanın matematiksel altyapısı, geleneksel türevlerin ve integral operatörlerinin genelleştirilmiş formlarına dayanır. En yaygın kullanılan tanımlar arasında Riemann-Liouville, Caputo ve Grünwald-Letnikov türevleri bulunur. Bu tanımların her biri farklı uygulamalara ve problemlere özgü avantajlar sunar. Kısaca bahsetmek gerekirse; Riemann-Liouville Türevi, tarihsel olarak ilk tanımlardan biri olup, çoğunlukla teorik çalışmalarda tercih edilir. Caputo Türevi, daha çok mühendislik ve uygulamalı matematik problemlerinde kullanılır, başlangıç koşullarını tanımlamada kolaylık sağlar. Grünwald-Letnikov Türevi ise nümerik hesaplamalarda ve algoritmalarda kullanımı yaygındır (Kilbas et al., 2006; Diethelm, 2010).

Bu farklı tanımların temelinde, türev işleminin yalnızca mevcut durumu değil, aynı zamanda tüm geçmiş durumları hesaba katan bir yapıya sahip olması yer alır. Kesirli türevler, bu özelliğiyle alışkanlık etkisine sahip sistemlerin modellenmesinde klasik türevlerin ötesine geçer.

2.2 Kesirli Diferensiyel Denklemler ve Özellikleri

Kesirli diferensiyel denklemler, diferensiyel denklemlerin kesirli türev ve integral operatörleri içeren genelleştirilmiş formudur. Bu denklemler, klasik diferensiyel denklemlere göre iki temel avantaj sağlar. Bu avantajlar;

- Uzun Vadeli Bağımlılıklar: Kesirli denklemler, sistemin geçmiş durumlarının gelecekteki davranış üzerindeki etkisini hesaba katar. Bu özellik, özellikle finansal piyasalardaki fiyat hareketleri ve volatilité analizinde önemlidir,
- Karmaşık Süreçlerin Modellenmesi: Normal dışı yayılma ve karmaşık yapılar gibi karmaşık süreçler, kesirli diferensiyel denklemlerle daha iyi temsil edilebilir (Mandelbrot, 1983; Metzler ve Klafter, 2000)

olarak özetlenebilir.

Kesirli diferensiyel denklemlerin çözümü genellikle analitik olarak elde edilemez; bu nedenle nümerik yöntemler yaygın olarak kullanılmaktadır. Ayrıca, bu denklemler başlangıç ve sınır koşullarının doğru tanımlanmasını gerektirir, çünkü yanlış tanımlanan başlangıç koşulları sistemin davranışını önemli ölçüde etkileyebilir (Diethelm, 2010).

2.3 Kesirli Hesaplamanın Finansal Matematikteki Yeri

Finansal matematikte kesirli diferensiyel denklemler, özellikle alışkanlık etkilerinin ve uzun vadeli bağımlılıkların olduğu durumlarda uygulanır. Örnek olarak;

- Volatilité Modelleme: Kesirli türevler, finansal piyasalardaki volatilitéyi modellemek için güçlü bir araç sunar. Geleneksel modellerde genellikle eksik temsil edilen geçmiş etkiler, kesirli yaklaşımlar sayesinde hesaba katılabilir,
- Opsiyon Fiyatlandırma: Black-Scholes modelinin kesirli versiyonu, piyasa volatilitésindeki belirsizlikleri ve geçmişe bağımlılığı daha gerçekçi bir şekilde modelleyerek klasik modelin eksikliklerini giderir (Cartea ve del-Castillo-Negrete, 2007),

- Risk Yönetimi: Kesirli modeller, portföy yönetiminde bellek etkilerini dikkate alarak risk analizi ve yönetimini daha etkili bir hale getirir (Mishura ve Zili, 2008)

verilebilir.

Kesirli diferensiyel denklemler, birçok avantaja sahip olmakla birlikte belirli zorluklar da barındırır. Avantaj olarak, uzun vadeli bağımlılıkların modellenmesi, daha gerçekçi ve karmaşık süreçlerin temsil edilmesi ve esnek matematiksel yapı, farklı uygulamalara uyarlanabilir olmaları, kısıtlama olarak da, analitik çözümlerin nadir olması, model parametrelerinin seçimi ve doğruluğu söylenebilir.

3 Finansal Problemlerde Kesirli Denklemlerin Kullanımı

3.1 Volatilite Modelleme

Finansal piyasalarda volatilite, fiyatların zaman içindeki oynaklığı ile tanımlanır ve risk analizi, opsiyon fiyatlandırma ve portföy yönetimi gibi birçok alanda kritik bir rol oynar. Volatilite genellikle geleneksel modellerle incelenir, ancak piyasalardaki uzun vadeli bağımlılıklar ve geçmiş olayların etkisi dikkate alınmadığında bu modeller yetersiz kalabilir. Kesirli diferensiyel denklemler, volatilitenin bellek etkileri ile analiz edilmesinde güçlü bir araç olarak öne çıkmaktadır (Comte ve Renault, 1998; Cartea ve del-Castillo-Negrete, 2007).

Örneğin, kesirli Heston modeli, klasik Heston volatilite modeline kıyasla daha geniş bir kapsama sahiptir. Bu model, volatilitenin uzun vadeli bağımlılıklarını ve karmaşık özelliklerini hesaba katarak, piyasalardaki dinamiklerin daha gerçekçi bir şekilde modellenmesini sağlar. Ayrıca, bu tür modeller, piyasa stres testlerinde ve risk senaryolarında daha güvenilir tahminler sunar.

3.2 Opsiyon Fiyatlandırma

Opsiyon fiyatlandırma, finansal matematiğin en önemli uygulama alanlarından biridir. Black-Scholes modeli, bu alanda bir devrim yaratmış olsa da, modelin varsayımları (sabit volatilite, geçmiş etkilerinin olmaması vb.) gerçek piyasa koşullarıyla tam anlamıyla örtüşmemektedir (Black ve Scholes, 1973; Merton, 1973). Bu noktada, kesirli Black-Scholes modeli, bu sınırlamaları aşmak için bir alternatif olarak geliştirilmiştir.

Kesirli Black-Scholes modeli, sabit volatilite yerine bellek etkilerini ve piyasanın tarihsel oynaklık profillerini hesaba katar. Bu modelin anahtar özelliği, volatilitenin yalnızca güncel piyasa koşullarına değil, aynı zamanda geçmiş olaylara da bağlı olmasıdır. Örneğin, piyasa çöküşleri ve yüksek volatilite dönemlerinin etkisi, kesirli türevler aracılığıyla modellenebilir ve bu durum, opsiyon fiyatlarının daha doğru bir şekilde belirlenmesine olanak tanır (Cartea ve del-Castillo-Negrete, 2007).

Kesirli modellerin bir diğer avantajı, piyasanın normal dışı hareketlerini daha iyi yansıtmalarıdır. Geleneksel Black-Scholes modelinde sıklıkla gözlemlenen "volatilite gülümsemesi" gibi normal dışı etkileri, kesirli yaklaşımlar ile daha iyi açıklanabilir (Metzler ve Klafter, 2000).

3.3 Risk Yönetimi ve Portföy Optimizasyonu

Finansal sistemlerde risk yönetimi, belirsizlikleri minimize etmek ve yatırımcıların kararlarını optimize etmek için kritik bir süreçtir. Geleneksel risk yönetimi modelleri, genellikle geçmiş verilerin mevcut ve

gelecekteki risk üzerindeki etkisini sınırlı bir şekilde dikkate alır. Kesirli diferensiyel denklemler, geçmiş veri bağımlılığını ve alışkanlık etkilerini dahil ederek, daha hassas risk analizleri yapılmasını sağlar (Mishura ve Zili, 2008).

Özellikle portföy optimizasyonunda, yatırım araçlarının getirileri arasındaki korelasyonun zamansal bağımlılıkları dikkate alınmalıdır. Kesirli modeller, bu korelasyonları daha iyi analiz ederek, yatırımcıların portföylerini optimize etmelerine yardımcı olur. Bu tür bir yaklaşım, yalnızca mevcut piyasa koşullarını değil, aynı zamanda uzun vadeli getiri profillerini de hesaba katar.

3.4 Finansal Zaman Serilerinin Analizi

Finansal zaman serilerinin analizi, piyasaların dinamiklerini anlamak ve gelecekteki fiyat hareketlerini tahmin etmek için kullanılan temel yöntemlerden biridir. Ancak, finansal zaman serilerinin doğası gereği uzun vadeli bağımlılık göstermesi ve alışkanlık etkilerine sahip olması, geleneksel yöntemlerin etkinliğini sınırlandırır. Kesirli zaman serisi modelleri, Hurst üssü gibi kavramlar aracılığıyla bu bağımlılıkları yakalamada başarılıdır (Hurst, 1951).

Kesirli Brown hareketi gibi stokastik süreçler, finansal zaman serilerinin doğasını daha iyi açıklayabilir. Bu süreçler, zaman serilerindeki alışkanlık etkilerini ve piyasa fiyatlarının karmaşık yapısını temsil eder. Özellikle volatilité kümelenmesi, uzun vadeli bağımlılık ve anomalik yayılma gibi piyasa özellikleri, kesirli süreçlerle daha iyi modellenenebilir (Mandelbrot, 1983).

Kesirli diferensiyel denklemler, yukarıda bahsedilenlerin yanı sıra örneğin kredi riski analizinde, kredi riskinin uzun vadeli bağımlılıklarını modellemek için kullanılmaktadır. Bu yöntem, bankaların ve finansal kurumların kredi risklerini daha etkili bir şekilde yönetmelerine yardımcı olabilir. Ya da örneğin, bir makroekonomik modellemede, ekonomik büyüme ve iş döngülerindeki uzun vadeli bağımlılıkları incelemek için de kullanılmaktadır (Diethelm, 2010).

4 Çözüm Yöntemleri ve Nümerik Yaklaşımlar

Kesirli diferensiyel denklemlerin çözümü, bu denklemlerin doğası gereği klasik diferensiyel denklemlerden daha karmaşıktır. Kesirli türev ve integral operatörlerinin hesaplama zorlukları, bu denklemler için hem analitik hem de nümerik çözüm yöntemlerinin geliştirilmesini zorunlu kılmıştır. Analitik çözümler yalnızca belirli sınırlı durumlar için elde edilebilirken, nümerik yöntemler daha genel ve karmaşık problemlerin çözümünde önemli bir araç olarak öne çıkar. Aşağıda, bu alandaki temel çözüm yöntemleri ele alınmıştır.

4.1 Analitik Çözüm Yöntemleri

Kesirli diferensiyel denklemlerin analitik çözümleri, genellikle özel durumlar ve idealize edilmiş problemler için mümkündür. Bu çözümler, teorik çalışmalarda önemli bir yer tutsa da, karmaşık finansal problemler için çoğu zaman uygulanabilir değildir. En yaygın kullanılan analitik yöntemler olarak,

- Laplace Dönüşümü: Kesirli diferensiyel denklemlerin çözümünde sıklıkla kullanılan bir yöntemdir. Bu teknik, özellikle Riemann-Liouville ve Caputo türevleriyle ifade edilen denklemlerin çözümünde etkilidir (Podlubny, 1999),

- Green Fonksiyonları: Kesirli denklemler için Green fonksiyonlarının kullanımı, başlangıç ve sınır koşullarına dayalı çözümler elde etmeyi mümkün kılar. Özellikle finansal problemlerde bu yöntem, başlangıç durumlarının etkilerini analiz etmek için faydalıdır (Kilbas et al., 2006),
- Seri Çözümleri: Güç serileri ve Mittag-Leffler fonksiyonları, kesirli diferensiyel denklemlerin analitik çözümünde önemli bir rol oynar. Mittag-Leffler fonksiyonu, kesirli sistemlerin zamanla azalan bellek etkilerini modellemek için sıklıkla kullanılır (Diethelm, 2010)

verilebilir.

4.2 Nümerik Çözüm Yöntemleri

Nümerik yöntemler, kesirli diferensiyel denklemlerin çözümünde en yaygın kullanılan araçlardır. Bu yöntemler, geniş bir problem seti için uygulanabilirlik sunar ve özellikle finansal problemlerdeki karmaşık süreçlerin modellenmesinde kritik bir rol oynar.

- Sonlu Farklar Yöntemi (Finite Difference Method): Kesirli türevlerin nümerik olarak çözümü için kullanılan en yaygın yöntemlerden biridir. Grünwald-Letnikov türevi, sonlu farklar yönteminin kesirli diferensiyel denklemlere uygulanmasında temel bir yaklaşımdır. Bu yöntem, zamanla değişen volatilitiyi modellemek gibi finansal problemlerde sıklıkla kullanılır (Meerschaert ve Tadjeran, 2004).
- Spektral Yöntemler: Kesirli diferensiyel denklemlerin çözümünde spektral yöntemler, çözüm doğruluğunu artırmak için kullanılmaktadır. Bu yöntem, çözüm fonksiyonlarını polinomlar veya trigonometrik fonksiyonlar gibi özel fonksiyonlarla ifade ederek hızlı ve doğru sonuçlar elde eder. Özellikle yüksek doğruluk gerektiren finansal modellemelerde etkilidir (Shen ve Wang, 2011).
- Adomian Ayrıştırma Yöntemi (Adomian Decomposition Method): Doğrusal olmayan kesirli diferensiyel denklemlerin çözümünde kullanılır. Yöntem, denklemi ayrıştırarak kolay çözülebilir alt problemlere ayırır. Bu yöntem, finansal risk modellemelerinde yaygın olarak uygulanmıştır (Jafari ve Daftardar-Gejji, 2006).
- Monte Carlo Simülasyonları: Monte Carlo yöntemleri, stokastik kesirli diferensiyel denklemler için güçlü bir çözüm aracıdır. Finansal uygulamalarda, özellikle opsiyon fiyatlandırma ve risk analizi gibi belirsizlik içeren durumlarda tercih edilir (Mishura ve Zili, 2008).

4.3 Yapay Zeka ve Makine Öğrenimi Destekli Yöntemler

Son yıllarda, yapay zeka (AI) ve makine öğrenimi (ML) yöntemleri, kesirli diferensiyel denklemlerin çözümünde yenilikçi bir yaklaşım olarak öne çıkmıştır. Bu yöntemler, karmaşık finansal sistemlerin modellenmesinde önemli avantajlar sunar:

- Derin Öğrenme (Deep Learning): Sinir ağları, kesirli diferensiyel denklemleri çözmek için kullanılan güçlü bir araç haline gelmiştir. Özellikle Recurrent Neural Networks (RNN) ve Convolutional Neural Networks (CNN), finansal zaman serilerinin analizi ve tahmini için kullanılmaktadır (Raissi et al., 2019).
- Veri Odaklı Yaklaşımlar: Büyük veri analitiği, kesirli diferensiyel denklemlerden türetilen finansal modellerin optimizasyonunda kullanılabilir. Bu yaklaşım, finansal verilerin uzun vadeli bağımlılıklarını ve bellek etkilerini analiz etmek için etkili bir araçtır (Wang ve Zhang, 2020).

Sonuç olarak çözüm yöntemlerinin bir karşılaştırılması tablo 1 de verilmiştir.

Tablo 1: Çözüm Yöntemlerinin Karşılaştırılması

| Yöntem | Avantajlar |
|------------------------------------|--|
| Sonlu Farklar Yöntemi (FDM) | Basit ve uygulaması kolay |
| Spektral Yöntemler | Yüksek doğruluk |
| Adomian Ayrıştırma Yöntemi | Doğrusal olmayan problemlere uygundur |
| Monte Carlo Simülasyonu | Stokastik süreçler için uygundur |
| Makine Öğrenimi Yöntemleri | Büyük veri setlerinde yüksek performans sağlar |

5 Finansal Problemlere Uygulamalar

Kesirli diferensiyel denklemlerin çözüm yöntemleri, finansal problemlere doğrudan uygulanabilir. Örneğin:

- Opsiyon fiyatlandırmada Monte Carlo simülasyonu, kesirli Black-Scholes modeline entegre edilebilir.
- Volatilite analizi için sonlu farklar yöntemi kullanılabilir.
- Portföy optimizasyonu için yapay zeka destekli veri analitiği uygulanabilir.

Kesirli diferensiyel denklemler, finansal sistemlerin dinamiklerini daha gerçekçi bir şekilde modellemek için kullanılır. Aşağıda, bu denklemlerin finansal uygulamalardaki kullanımına dair somut örnekler sunulmuştur.

5.1 Kesirli Black-Scholes Modeli ile Opsiyon Fiyatlandırma

Klasik Black-Scholes modeli, opsiyon fiyatlandırmada temel bir araçtır; ancak piyasa verilerindeki bellek etkilerini ve uzun vadeli bağımlılıkları göz ardı eder. Bu eksiklikleri gidermek amacıyla, kesirli türevler kullanılarak modelin genelleştirilmiş bir versiyonu geliştirilmiştir. Örneğin, bir Avrupa tipi alım opsiyonunun fiyatlandırılmasında, kesirli Black-Scholes modeli kullanılarak, volatilitenin geçmişe bağımlılığı ve piyasa bellek etkileri hesaba katılır. Bu yaklaşım, opsiyon fiyatlarının piyasa verileriyle daha uyumlu olmasını sağlar (Cartea, Á. & del-Castillo-Negrete, D., 2007)

5.2. Kesirli Heston Modeli ile Volatilite Tahmini

Heston modeli, stokastik volatilitiyi modellemek için yaygın olarak kullanılır; ancak volatilitenin uzun vadeli bellek etkilerini tam olarak yansıtmaz. Kesirli Heston modeli, bu bellek etkilerini dahil ederek volatilitite tahminlerinin doğruluğunu artırır. Örneğin, bir hisse senedinin gelecekteki volatilitesini

tahmin etmek için kesirli Heston modeli uygulanır. Bu model, volatilitenin geçmiş değerlerine olan bağımlılığı dikkate alarak, daha isabetli tahminler sunar (Comte, F. & Renault, E., 1998).

5.3. Kesirli Vasicek Modeli ile Faiz Oranı Dinamikleri

Vasicek modeli, faiz oranlarının dinamiklerini modellemek için kullanılır; ancak kısa vadeli bellek etkilerini göz ardı eder. Kesirli Vasicek modeli, bu etkileri dahil ederek faiz oranı tahminlerinin doğruluğunu artırır. Örneğin, Merkez bankasının politika faiz oranlarının gelecekteki seyrini tahmin etmek için kesirli Vasicek modeli kullanılır. Bu model, faiz oranlarının geçmiş eğilimlerini ve bellek etkilerini dikkate alarak, daha güvenilir tahminler sağlar (Mishura, Y. & Zili, M., 2008).

5.4. Kesirli GARCH Modelleri ile Volatilite Kümelenmesi

GARCH modelleri, finansal zaman serilerindeki volatilitenin kümelenmesini modellemek için kullanılır; ancak uzun vadeli bağımlılıkları tam olarak yansıtmaz. Kesirli GARCH modelleri, bu bağımlılıkları dahil ederek volatilitenin tahminlerinin doğruluğunu artırır. Örneğin, bir borsa endeksinin günlük getiri volatilitelerini tahmin etmek için kesirli GARCH modeli uygulanır. Bu model, volatilitenin uzun vadeli bağımlılıklarını ve bellek etkilerini dikkate alarak, daha isabetli tahminler sunar (Baillie, R. T., Bollerslev, T. & Mikkelsen, H. O., 1996).

5.5. Kesirli Brownian Hareketi ile Piyasa Modelleme

Kesirli Brownian hareketi, finansal piyasalardaki bellek etkilerini ve uzun vadeli bağımlılıkları modellemek için kullanılır. Bu yaklaşım, varlık fiyatlarının dinamiklerini daha gerçekçi bir şekilde yansıtır. Örneğin, bir hisse senedinin fiyat hareketlerini modellemek için kesirli Brownian hareketi kullanılır. Bu model, fiyatların geçmiş hareketlerine olan bağımlılığını ve bellek etkilerini dikkate alarak, daha doğru simülasyonlar sağlar (Mandelbrot, B. B. & Van Ness, J. W., 1968).

Sonuç olarak tablo 2 de, bazı finansiyel problemler, bu problemlerin çözümü için ilgili kesirli modeller ve bu modellerin amaçları gösterilmiştir.

Tablo 2: Kesirli Denklemler ve Çözülen Problemler

| Problem | Kesirli Denklem | Amaç |
|-------------------------|--------------------------------|---|
| Opsiyon Fiyatlandırma | Kesirli Black-Scholes Modeli | Bellek etkileri ile opsiyon fiyatlarının daha doğru belirlenmesi |
| Volatilite Tahmini | Kesirli Heston Modeli | Stokastik volatilitenin geçmiş bağımlılıklarla modellenmesi |
| Faiz Oranı Modelleme | Kesirli Vasicek Modeli | Faiz oranlarındaki uzun vadeli bağımlılıkların analizi |
| Zaman Serisi Analizi | Kesirli Zaman Serisi Modelleri | Finansal zaman serilerinin uzun vadeli bağımlılıklarla modellenmesi |
| Kredi Riski Analizi | Kesirli Kredi Risk Modelleri | Kredi temerrüt riskinin geçmiş verilere dayalı tahmini |
| Makroekonomik Modelleme | Kesirli Dinamik Modeller | Ekonomik büyüme ve iş döngülerindeki bağımlılıkların incelenmesi |

6. Sonuç ve Gelecek Çalışmalar

6.1. Sonuç

Kesirli diferensiyel denklemler, geleneksel matematiksel modelleme yöntemlerinin ötesine geçerek, finansal problemlerin karmaşık dinamiklerini anlamada ve çözüm üretmede önemli bir araç olarak karşımıza çıkmaktadır. Bu denklemler, özellikle finansal piyasalarda gözlemlenen alışkanlık etkilerini, uzun vadeli bağımlılıkları ve normal dışı yayılma süreçlerini modellemede büyük bir avantaj sağlamaktadır.

Bu çalışmada, finansal matematikte, volatilité modellemesi, opsiyon fiyatlandırma, faiz oranı modelleme, portföy optimizasyonu ve kredi riski analizi gibi birçok kritik alanda kesirli modellerin uygulanabilirliği gösterilmiştir. Örneğin, kesirli Black-Scholes modeli, volatilitenin geçmişe bağımlılığını hesaba katarak daha doğru opsiyon fiyatları sunarken, kesirli Heston modeli volatilitenin uzun vadeli bellek etkilerini daha hassas bir şekilde yakalamaktadır. Ayrıca, kesirli zaman serisi modelleri ve Brownian hareketi gibi yaklaşımlar, finansal piyasalardaki dinamiklerin daha derinlemesine analizine olanak tanımaktadır.

Bununla birlikte, kesirli diferensiyel denklemlerin çözümü bazı zorluklar içermektedir. Parametrizasyon sorunları ve nümerik yöntemlerin hassasiyeti gibi faktörler, bu modellerin finansal problemlerde yaygın bir şekilde kullanılabilmesinin önündeki başlıca engellerdir. Ancak, bu alandaki teknolojik ve yöntemsel ilerlemeler, gelecekte bu zorlukların üstesinden gelinmesini sağlayabilecek, geliştirilebilir bir potansiyele işaret etmektedir.

6.2. Gelecek Çalışmalar

Kesirli diferensiyel denklemler ve finansal matematik alanındaki araştırmalar, önümüzdeki yıllarda birçok yenilikçi çalışmaya kapı aralayacak gibi görünmektedir. Bu kapsamda, gelecek çalışmalarda aşağıdaki alanların öne çıkması beklenmektedir:

- **Daha Gelişmiş Nümerik Yöntemler:** Yüksek doğruluk sunan yeni algoritmalar, hem akademik çalışmalar hem de endüstriyel uygulamalar için büyük önem taşımaktadır,
- **Makine Öğrenimi ve Yapay Zeka Uygulamaları:** Gelecekte, derin öğrenme algoritmalarının, özellikle büyük finansal veri setleriyle entegre edilerek daha etkili kesirli modeller oluşturulmasında önemli bir rol oynaması beklenmektedir.
- **Stokastik Kesirli Modeller:** Bu modeller, özellikle risk analizi, türev ürünler ve portföy yönetimi gibi alanlarda daha sofistike çözümler üretmek için geliştirilebilir.
- **Ekonomik ve Makroekonomik Uygulamalar:** Gelecekte, bu modellerin makroekonomik politikaların analizinde ve uzun vadeli ekonomik tahminlerde daha yaygın bir şekilde kullanılması beklenmektedir.
- **Çoklu Kesirli Sistemler:** Gerçek finansal sistemler genellikle birden fazla bağımsız değişkene ve karmaşık etkileşimlere sahiptir. Bu nedenle, çoklu kesirli diferensiyel denklemlerin geliştirilmesi, bu tür sistemlerin daha iyi anlaşılmasını sağlayabilir. Özellikle, finansal varlıklar arasındaki korelasyonların ve çapraz etkilerin modellenmesi bu alandaki önemli bir araştırma konusu olacaktır.
- **Gerçek Zamanlı Uygulamalar:** Finansal piyasalarda gerçek zamanlı veri analizi ve karar verme süreçleri, giderek daha fazla önem kazanmaktadır. Kesirli modellerin gerçek zamanlı veri akışlarına entegre edilmesi, yatırım kararları ve risk yönetimi için daha etkili araçlar sunabilir.

- Kesirli Modelleme Yazılımları ve Araçları: Özellikle finans sektöründe, bu tür araçların kullanımıyla modelleme süreçlerinin hızlanması ve kolaylaşması beklenmektedir.
- Ekosistem Uygulamaları ve Sürdürülebilirlik: Kesirli modeller, finansal sistemlerin sürdürülebilirlik analizi ve çevresel etkilerinin değerlendirilmesinde de kullanılabilir. Örneğin, karbon piyasalarının dinamiklerini modellemek ve çevresel riskleri analiz etmek için kesirli modellerin uygulanması, yeni bir araştırma alanı olarak dikkat çekmektedir.

Sonuç olarak, kesirli diferensiyel denklemler, finansal problemlerin çözümünde ve finansal sistemlerin dinamiklerini anlamada büyük bir potansiyele sahiptir. Gelecekte, bu modellerin daha geniş bir uygulama yelpazesinde kullanılabilmesi için hem teorik hem de pratik düzeyde ilerlemeler beklenmelidir. Özellikle teknolojik gelişmeler ve veri analizindeki yenilikler, bu alandaki çalışmalara hız kazandıracaktır.

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Analyzing State-Nation Building in Fragmented Societies: A Case Study of Afghanistan (2002-2021)*

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ABSTRACT

This study analyzes the process of state-nation building in Afghanistan's fragmented society between 2001 and 2021, focusing on the key challenges encountered. Employing an analytical-complementary approach and qualitative data drawn from desk research, the study highlights Afghanistan's historical struggle with structural and identity-related obstacles to nation-building. Following the 2001 U.S.-led intervention and with international support, efforts were initiated to establish a democratic and participatory state. However, the centralization of power and the failure to recognize ethnic diversity significantly impeded the creation of a stable nation-state. The findings indicate that meaningful progress requires structural reforms, institutional strengthening, and the genuine inclusion of all ethnic groups. Recommended measures include transitioning toward a decentralized governance model, combating corruption, and redefining national identity. Overall, Afghanistan's experience over the past two decades underscores that without embracing ethnic pluralism, consolidating independent institutions, and adopting an inclusive nation-building strategy, sustainable stability will remain elusive.

Keywords: State-nation building, fragmented society, Identity diversity, decentralization, Afghanistan.

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Cite as: Sayed Nasim Bahman, S.N., & Türkmenoğlu Köse, D. (2025). Analyzing State-Nation Building in Fragmented Societies: A Case Study of Afghanistan (2002-2021). *Journal of Business and Trade*, 6(1), 68-91. <https://doi.org/10.58767/joinbat.1661799>

*This article was prepared under the supervision, consultation, and collaboration of Doç. Dr. Dilşad Türkmenoğlu Köse and is based on Sayed Nasim Bahman's doctoral dissertation titled 'Analyzing State-Nation Building in a Fragmented Society: A Case Study of Afghanistan (2001-2021),' conducted at Sakarya University, Institute of Social Sciences, Faculty of Political Sciences, Department of Political Science and Public Administration.

Parçalanmış Toplumlarda Devlet-Ulus İnşasının Analizi: Afganistan'ın Bir Vaka Çalışması (2002-2021)

ÖZ

Bu çalışma, 2001–2021 yılları arasında Afganistan'ın parçalanmış toplumunda ulus-devlet inşası sürecini ve karşılaşılan temel zorlukları incelemektedir. Analitik-tamamlayıcı bir yaklaşım ve masa başı araştırmalarına dayanan nitel veriler kullanılarak gerçekleştirilen bu çalışma, Afganistan'ın tarihsel deneyimlerinin ulus-devlet inşasında her zaman yapısal ve kimlik temelli zorluklarla karşılaştığını ortaya koymaktadır. 2001'de ABD öncülüğündeki müdahale ve uluslararası toplumun desteğiyle demokratik ve katılımcı bir devlet kurma yönünde çabalar başlatılmıştır. Ancak, iktidarın merkezileşmesi ve kimlik çeşitliliğinin tanınmaması, istikrarlı bir ulus-devletin inşasını önemli ölçüde engellemiştir. Bulgular, anlamlı bir ilerlemenin yapısal reformlar, devlet kurumlarının güçlendirilmesi ve tüm etnik grupların gerçek katılımını gerektirdiğini göstermektedir. Önerilen çözümler arasında adem-i merkezîyetçi bir yönetim modeline geçiş, yolsuzlukla mücadele ve ulusal kimliğin yeniden tanımlanması yer almaktadır. Genel olarak, Afganistan'ın son yirmi yıllık deneyimi, etnik çoğulculuğu benimsemeden, bağımsız kurumları güçlendirmeden ve kapsayıcı bir ulus inşa yaklaşımı geliştirmeden kalıcı istikrara ulaşılamayacağını göstermektedir.

Anahtar Kelimeler: Ulus-devlet inşası, parçalanmış toplum, kimlik çeşitliliği, merkezîyetsizlik, Afganistan.

1. Introduction

The modern nation-state is a European phenomenon that emerged alongside the development of modernity, particularly with the rise of capitalism. In Europe, bureaucratic and financial reforms, combined with economic growth, facilitated the transition from feudalism to capitalism (Tilly, 1992: 14). However, in peripheral societies, the process of nation-state building has often been shaped and driven by political elites (Wallerstein, 1974: 66–88). While some countries have successfully established modern nation-states through modernization and institutional development, this process has largely failed in multi-ethnic societies such as Afghanistan. The crisis of nation-state building in Afghanistan dates back to the country's founding in 1747 and continues to the present day. Rather than forming a government with a broad national base, successive Afghan governments have prioritized consolidating power within specific ethnic groups (Rubin, 2002: 15–17). The imposition of ethnic identity and a centralized system of governance has not only obstructed the creation of a modern nation-state but has also deepened social divisions, undermined national solidarity, and perpetuated political and security crises. As a result, Afghanistan's multi-ethnic social structure and centralized political system remain major obstacles to effective state-building.

This research examines the nation-state building process in Afghanistan between 2001 and 2021. This period was selected because it represents a decisive chapter in Afghanistan's modern history, beginning with the U.S.-led intervention that toppled the Taliban regime and ending with the withdrawal of international forces and the Taliban's return to power. These two decades mark the most intensive and internationally supported attempt to establish a stable and democratic nation-state in Afghanistan, involving large-scale political, military, and developmental interventions. The study systematically addresses the following research questions: Why has the nation-state building process remained incomplete in Afghanistan? What have been the primary obstacles to its success? How have ethnic diversity and the post-2001 political structure impeded this process? And why did this nation-state building project ultimately fail despite two decades of foreign intervention?

To contextualize this research, several key works have been reviewed, each addressing state-building and nation-building in Afghanistan from different perspectives. State Formation in Afghanistan: A

Theoretical and Political History by Mujib Rahman Rahimi (2017) critiques the official narrative of state-building from a postmodern and postcolonial perspective, arguing that it has been predominantly shaped by the Pashtun elite and influenced by British colonial knowledge. However, this work has been criticized for its selective use of data, neglect of internal factors, and excessive reliance on Persian and Arabic sources. In comparison, the present study adopts a more comprehensive approach. *The Roots of the Failure of Nation-Building and State-Building in Afghanistan* by Aziz Aryanfar (2016) examines the failure of state-building and offers policy recommendations, but it has been criticized for lacking theoretical and methodological coherence and for the influence of personal and ideological biases on its analysis. This study seeks to address these limitations by employing a rigorous scientific framework. *American Nation-Building: A Comparison of Iraq and Afghanistan* by Mirwais Balkhi (2020) explores the role of the United States in nation-building efforts in both Afghanistan and Iraq, focusing on direct U.S. involvement, leadership in state modernization, political development, and the top-down nation-building model. However, this work has been criticized for its heavy reliance on official U.S. narratives, its failure to incorporate local perspectives, and its insufficient examination of internal factors. In contrast, the present research analyzes state-nation building in Afghanistan without bias toward Western narratives, considering both internal and external influences. *Afghanistan and the Modern State* by Abdul Ali Mohammadi (2015) focuses on the legal dimensions of state formation, arguing that existing laws are insufficient for establishing a modern state. However, its purely legal approach overlooks the political and social dimensions of state-building. Unlike Mohammadi's work, this study adopts political and social science perspectives rather than being confined to legal frameworks. Similarly, *The Making of Modern Afghanistan* by B.D. Hopkins focuses less on state-building and more on the political economy of the British Empire and its impact on the region. Covering only a brief period of Afghan history, it lacks a comprehensive analysis of the nation-state building process. In contrast, this study aims to provide a holistic and multidimensional analysis of the factors shaping state-building in Afghanistan. Additionally, several important studies conducted in Turkey have examined Afghanistan's state- and nation-building processes, particularly focusing on Turkey's foreign policy and engagement in Afghanistan. Scholars such as Özkan (2011), Erşen (2014), and Aydın and Açıkmeşe (2007) have analyzed Turkey's contribution to Afghanistan's stabilization efforts, emphasizing its soft power approach, development aid, educational initiatives, and military training missions. While these works offer valuable insights into Turkey's role and motivations, they often focus primarily on Turkey's diplomatic and strategic interests, paying less attention to Afghanistan's internal structural and identity-related challenges. Building on this existing literature, the present study primarily focuses on the domestic dimensions of state- and nation-building in Afghanistan and seeks to provide a more comprehensive and multidimensional analysis of the Afghan experience.

In summary, while the reviewed studies, research, and articles examine state-building from different perspectives, they reveal certain limitations, such as one-sided viewpoints, historical and political biases, and an overly narrow focus on legal or economic aspects. This study aims to offer a more comprehensive analysis by integrating various political science approaches. As an applied research project, its findings are intended to inform policy reforms in Afghanistan's state-nation building process. Methodologically, the study employs an analytical and integrative approach, identifying key challenges and proposing potential solutions. Data were collected using qualitative methods, particularly through documentary analysis of books, reports, and academic sources. This methodological framework allows for a deeper exploration of the historical, social, and political factors shaping state-nation building, while addressing the shortcomings of earlier one-dimensional studies.

2. Theoretical Framework: Modern Nation State and State- Nation Building Models in Fragmented Society

The state is a central concept in this study, and its definition remains complex and multifaceted. As a result, providing a precise definition of the state has always been challenging. Easton (1971: 106-115) acknowledges this difficulty, stating that “the state is an ambiguous, fluid, and complex concept that is difficult to define.” Among various perspectives, Weber’s definition is widely regarded as the dominant consensus among scholars regarding the key elements of the state. According to Weber, “the state is a human institution that has a monopoly on the legitimate use of coercive power within a given territory” (Weber, 1946: 78).

Another essential concept in this research is nation-state building, a multidimensional process that encompasses institution-building, peace-building, and nation-building. Scholars have emphasized different aspects of this process. Fukuyama (2004: ix) views it as the enhancement of state capacity, while Brinkerhoff (2005) associates it with the reconstruction of legitimacy, security, and governance in post-conflict societies. Research centers like RAND link nation-state building to the establishment of civil order and the improvement of state institutions in countries affected by crises (Pan, 2003).

A further key concept in this study is fragmented society, which refers to “societies that face deep historical, ethnic, linguistic, religious, and identity divisions, often accompanied by a bloody past marked by political supremacist struggles” (Rahimi, 2018: 42). These societies are often plagued by political struggles aimed at ethnic or ideological supremacy, which further exacerbates internal divisions. The diversity of ethnic and linguistic structures in such societies has disrupted the process of nation-state formation and led to tragic events. Examples include apartheid in South Africa, ethnic cleansing in Europe (including the killing of Jews in Germany and the expulsion of Germans from Poland after World War II), the genocide of the Tutsi in Rwanda, and ethnic wars in Afghanistan (Rezaei, 2015: 100).

State- Nation building in fragmented societies characterized by ethnic, religious, and linguistic diversity is among the most complex challenges in political science. In such societies, social and political divisions, coupled with the inability of elites to form coalitions, are the primary obstacles to the processes of nation-state building, peace-building, and the establishment of a democratic political order. Therefore, in the process of nation-state building in these societies, it is essential to recognize the legitimacy of the state among different groups and ensure the fair distribution of resources and power. Historical evidence suggests that nation-state building in such societies has typically followed three major models, which will be explored further in this study.

The assimilation model is one of the approaches to nation-state building, where the state attempts to create a single national identity and place ethnic groups into a unified framework (Yinger, 1985: 30). This model is typically implemented through the promotion of the official language, educational reforms, strengthening national symbols, and, in some cases, repressive policies (Barth & Noel, 1972: 336). In democratic societies, this process is carried out peacefully and gradually, as seen in post-revolutionary France, which established a unified national identity through the promotion of the French language and national symbols (Shakdam, 2018: 15). However, in authoritarian systems, states often use violence and repression to impose national unity, as seen in the suppression of the Kurds in Iraq by Saddam Hussein (Premdas, 2002: 16-35) or the case of Yugoslavia, which, despite efforts to manage ethnic diversity, ultimately faced internal conflicts and disintegration (Sabzalei, 2011: 817-818).

Another model of nation-state building in fragmented societies is the pluralist model. The pluralist model emphasizes the acceptance of ethnic, cultural, and religious diversity, allowing groups to belong to a territorial nation-state while preserving their identities (Marger, 1992: 163). This model is primarily implemented in democratic and liberal societies that emphasize equal rights, the rule of law, and political participation. Its two main forms are egalitarian pluralism (which ensures equal status for groups) (Peterson, 1980: 31) and unequal pluralism (where power is unevenly distributed) (Kuper & Smith, 1969: 11). Successful examples of this model can be seen in countries like Switzerland, Canada, the United States, and India. However, in some of these countries, challenges such as separatism and inequality in resource distribution continue to pose significant obstacles to the pluralist model of nation-state building (Hajiani, 2001: 122).

One more model is the unity-in-plurality model, which stresses the integration of cultural, linguistic, and ethnic diversity with national unity. Unlike the assimilation model, which imposes a single identity, the unity-in-plurality model recognizes differences and emphasizes the creation of a common national identity through the participation of all groups. This model prioritizes collective and group rights over individual interests, aiming to foster national cohesion through equal opportunities, voluntary participation, and social justice (Nourmohamadi, 2024: 212). The two key policies in this model are the politics of difference, which accepts fundamental differences between the majority and minorities, and the politics of recognition, which acknowledges the identity of minorities (Nazari & Sazman, 2015: 117). Successful examples of this model can be observed in Belgium, Singapore, and South Africa. This model aims to strengthen social cohesion and political stability in multi-ethnic societies by embracing diversity and creating equal opportunities for all groups.

Ultimately, state-nation building in multi-ethnic societies requires a delicate balance between strengthening national solidarity, respecting the rights of different groups, and preserving cultural diversity. The success of nation-state building, therefore, depends on the state's ability to balance national unity, social justice, and respect for cultural diversity, ensuring stability in multi-ethnic societies.

3. Afghanistan: Fragmented Society, State Development, and the Context of State-Nation Building

Afghanistan, located in Central and South Asia, covers an area of 652,230 km² and is composed of 34 provinces (Wilayat), with its capital in Kabul. Afghanistan is a fragmented and ethnically diverse society, home to 55 ethnic groups that speak 45 different languages (Summer Institute of Linguistics). Morgenstern (1929) referred to Afghanistan as "a linguistic and ethnic treasure trove," while Barfield (2010) described it as "a paradise of languages." The latest constitution of Afghanistan officially recognizes fourteen ethnic groups, with the Pashtuns, Tajiks, Hazaras, and Uzbeks being the principal ethnic groups and having historically held significant political influence. Max Klimburg has classified the ethnic groups of Afghanistan into three broad categories.

Figure 1. Social Structure of Afghanistan

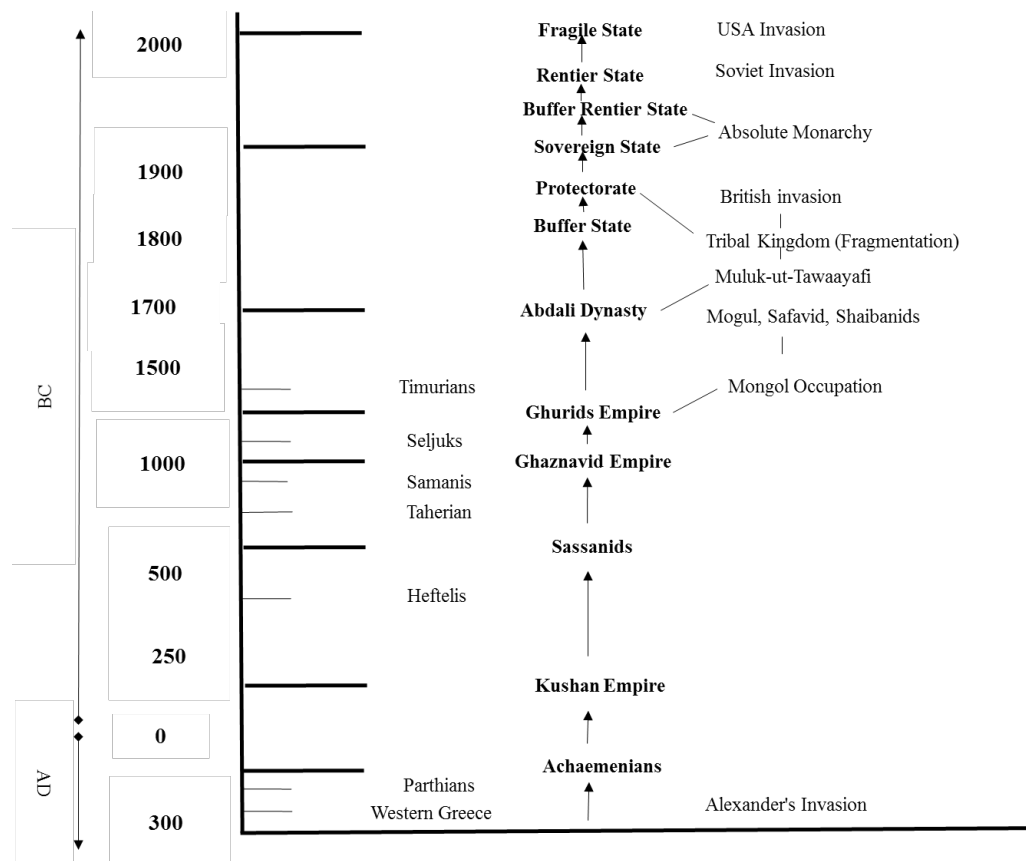
| Ethnic Group | | Language | Religion |
|--------------------------------|--------------|-----------|---------------------|
| Iranian Ethnic Groups | Pashtuns | Pashto | Sunni & Shia |
| | Tajik | Persian | Sunni |
| | Aimaq | Persian | Sunni |
| | Baloch | Balochi | Sunni |
| Turkic and Mongolian Ethnicity | Uzbeks | Uzbek | Sunni |
| | Turkmen | Turkmen | Sunni |
| | Hazara | Persian | Shia & Ismaili |
| | Kyrgyz | Kyrgyz | Sunni |
| | Qizilbash | Persian | Shia |
| Indian Ethnic Groups | Nuristanis | Nuristani | Sunni |
| | Pashai | Pashai | Sunni |
| | Sikh & Hindu | Punjabi | Sikhism Hinduism |

Source: (Fröhlich, 1970: 192-193)

As illustrated in the figure above, the ethnic groups of Afghanistan are categorized into three broad groups: the Iranian group, which includes Pashtuns, Tajiks, Aimaqs, and Baluchis; the Turkic and Mongol group, which includes Uzbeks, Turkmen, Hazaras, Kyrgyz, and Qizilbash; and the Indian group, which includes Nuristanis, Baluchis, and Sikh-Hindus (Fröhlich, 1970: 192-193). It is important to note that Baluchis are mentioned in both the Iranian and Indian groups due to their diverse historical and cultural affiliations. Linguistically, Afghanistan is a highly diverse country with numerous dialects. However, Persian (Dari), Pashto, Uzbek, and Turkmen are the most widely spoken languages. Despite this linguistic diversity, accurate demographic statistics on Afghanistan's ethnic composition are unavailable, and various sources present differing and often scientifically unreliable figures.

The historical background of state formation in Afghanistan indicates that before the emergence of a quasi-modern centralized state, this region was under the dominion of overlapping and borderless empires and local monarchies. Political authority was divided among khans, mirs, local kings, and imperial rulers, each exerting influence over different territories (Sadr, 2021: 123-124). After the fall of the Achaemenid Empire (550-330 BC), multiple ruling entities emerged in the region. Several dynasties governed Afghanistan at different historical periods, including the Kushans, Yuezhi-Hephthalites (Yaftals), Tahirids, Safavids, Samanids, Ghaznavids, Ghurids, Seljuks, and Timurids (Sadr, 2021: 124).

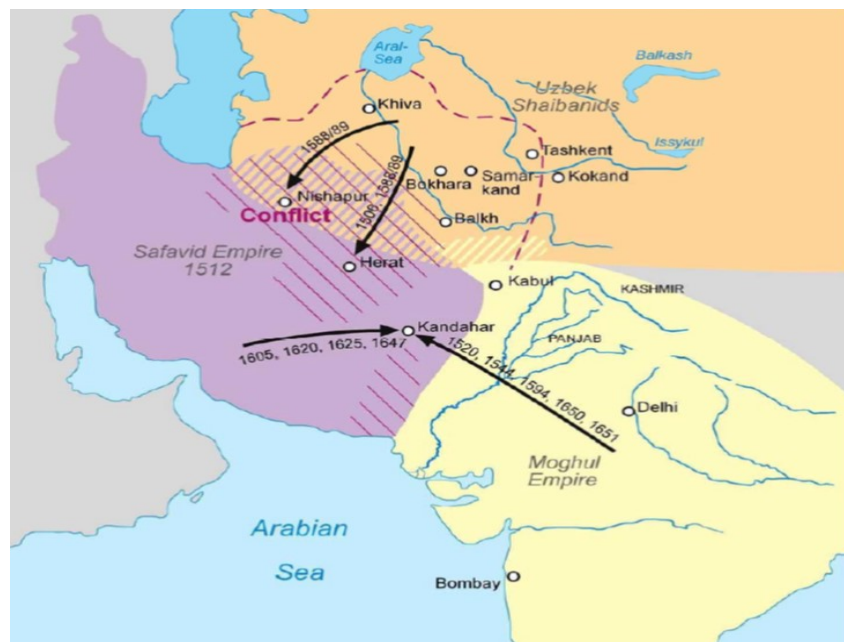
Figure 2. State Development in Afghanistan



Source: (Kohistani, 2009: 21)

As shown in the figure above, the territory that is now Afghanistan was ruled by various empires and regional governments before the formation of an independent state. The region was part of larger empires that primarily controlled lands in modern-day India, Iran, and Central Asia. Following the collapse of the Timurid dynasty in Herat in 1506, Afghanistan was divided among three empires: the Mughal Empire (Indo-Mongol), the Safavid Empire, and the Uzbek Shaybanids. This division persisted until 1747 (Banuazizi, 1986: 25). This period, known as "Frontier Feudalism" (1500-1747), was marked by Afghanistan's lack of a distinct political identity, with the region serving as a contested battleground between the Safavids, the Mughals, and the Uzbek Shaybanids (Olesen, 1995: 21).

Map 1. *Afghanistan before the Durrani Dynasty (16th century)*



Source: (Kohistani, 2009: 48)

As shown in the map above, the northern regions of Afghanistan were under the rule of the Shaybanids, the west was influenced by the Safavids, and the south and southeast were dominated by the Mughal Empire. Over more than two centuries of competition between regional powers and internal conflicts among feudal units, these struggles laid the foundation for political self-awareness and the politicization of ethnicity in Afghanistan (Daheshyar, 2008: 8).

In the 18th century, Afghanistan entered a new phase of state development. The Pashtun Durrani dynasty initially emerged as a tribal federation and later evolved into a quasi-modern state (Sharan, 2016: 63). A century after the formation of the modern international system in Europe (1648), Afghanistan saw the emergence of its first independent political authority (Daheshyar, 2009: 1052). This period, known as the period of Durrani rule and expansion (1747–1800) (Shahrani, 1986: 25), began after the death of Nader Afshar, which created a power vacuum. Ahmad Shah Abdali, one of Nader's commanders, was able to establish the Durrani Confederation in 1747. This government dominated Afghanistan until 1800. Through numerous military campaigns, Ahmad Shah established and expanded his empire from Central Asia to the Arabian Sea, consolidating his power. Some historians have referred to it as "the largest empire in the region after the Ottoman Empire" (Rasanayagam, 2007: 22).

Map 2. Territories of the Durani Confederation



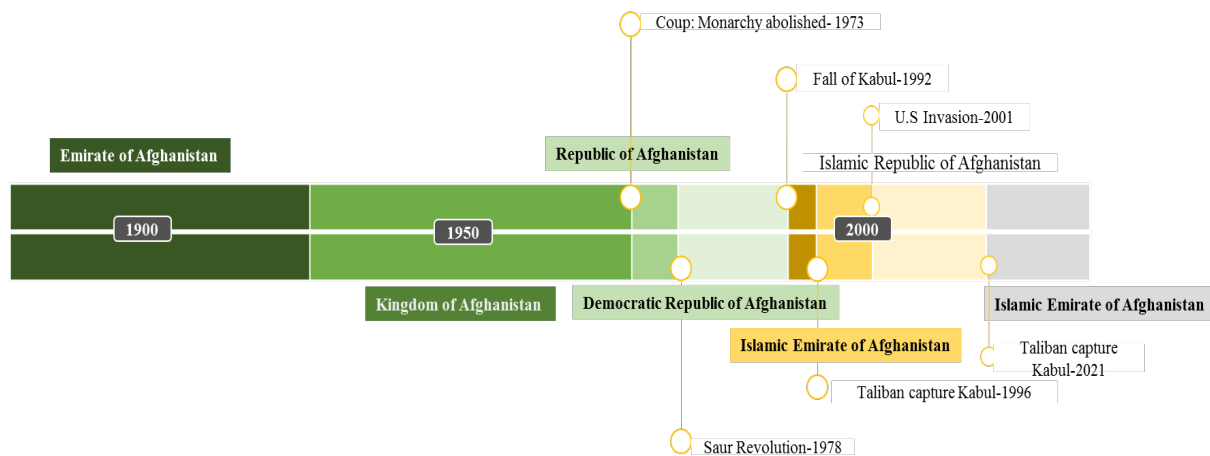
Source: Karimi, 2020

At its height, the Durrani Confederation, founded by Ahmad Shah Abdali, encompassed regions from Nishapur to New Delhi and from Balkh and Bukhara to the Indian Ocean (Karimi, 2020). The confederation lasted for 26 years, and its political structure was primarily based on tribal leaders and landowning families. Ahmad Shah's reign was marked by devastating wars, including the massacre of thousands at the Battle of Panipat and the widespread destruction of Sikh temples. His pursuit of power intensified internal conflicts within Afghanistan (Manaqbi, 2021).

After Ahmad Shah's death, Timur Shah Durrani ascended to the throne and moved the capital from Kandahar to Kabul. He ruled for 20 years, during which he faced internal rebellions. Timur Shah was eventually poisoned in Peshawar due to an internal conspiracy (Shahrani, 1986: 32). Following his death, internal disputes within the Durrani dynasty, combined with the rise of regional powers such as the Qajars in Iran and the British in India, accelerated the gradual collapse of the Durrani Empire. Conflicts among Timur Shah's descendants plunged Afghanistan into chaos, and by 1880, a large portion of the Durrani Empire's territories had been lost (Ghbar, 1999: 378).

From the late 19th century, Afghanistan became an arena of competition between Tsarist Russia and Britain. Russia annexed northern Afghanistan, while Britain brought the southern regions under its influence, weakening the country and turning Afghanistan into a geopolitical buffer (Cullather, 2002). Despite gaining independence in 1919, Afghanistan remained a buffer state between the two powers until 1955 (Wafayezada, 2013: 95). In the 20th century, Afghanistan increasingly moved towards a rentier state system based on patronage networks (Ibrahimi, 2019: 43). Following the Saur Revolution of 1978, which led to the overthrow of Daud Khan's republic, Afghanistan entered a prolonged period of severe political crisis, especially after 1980.

Figure 3. *The Evolution of the State in Afghanistan*

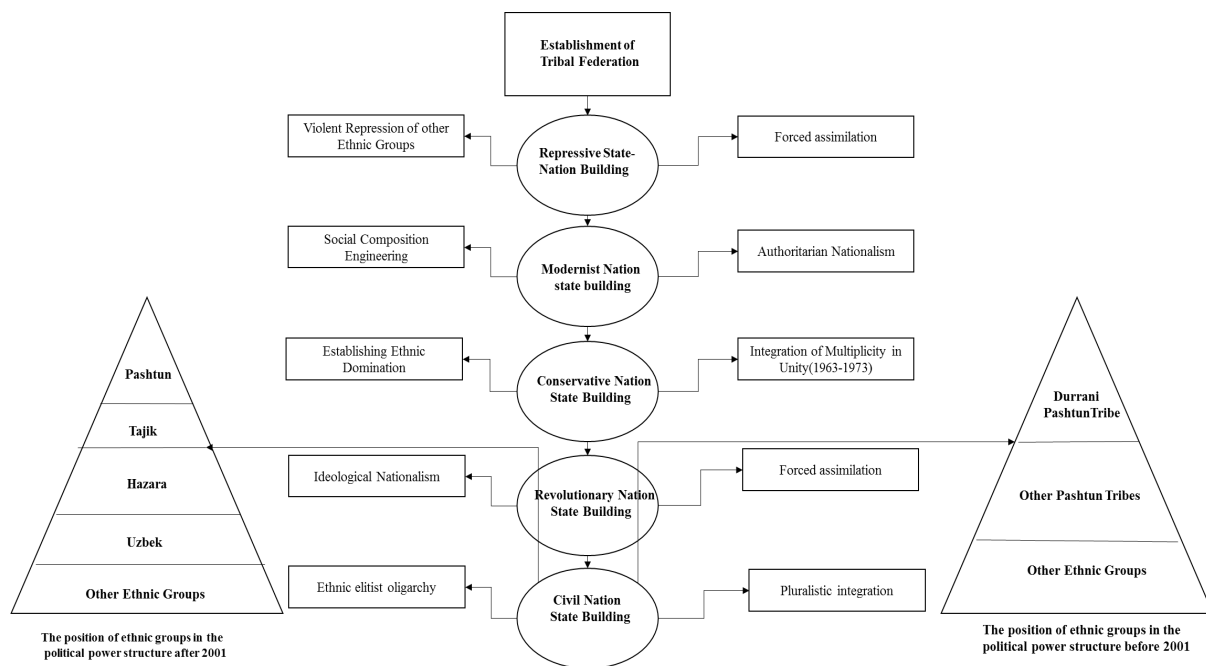


Source: (Geography and Political History, 2024)

As shown in the figure above, although Afghanistan's political system underwent changes, the rentier nature of the state persisted until 1978. After 1978, Afghanistan entered a period of severe political crises, and from the 1980s onward, the country was governed by fragile and failed states, characterized by a legitimacy crisis and inefficiency.

The focus now shifts to assessing the process of state- nation building in Afghanistan and its historical background. Since the 18th century, Afghanistan's efforts to establish a modern state-nation have faced numerous challenges and have not achieved satisfactory results. The process of state-nation building in Afghanistan has consistently been influenced by Pashtun nationalism, political centralization, and ethnic supremacy. After the establishment of the Afghan state in 1747 by Ahmad Shah Durrani, a political structure based on the unity of Pashtun tribes was formed, and the country's political identity was constructed around this ethnic group (Olesen, 1995: 21). This model of state-nation building was used as a tool to consolidate ethnic supremacy, hindering the formation of inclusive and participatory political institutions. As a result, rather than fostering national cohesion, it set Afghanistan on a path of social divergence and fragmentation.

Figure 4. The Background of the State- Nation Building in Afghanistan



Source: It was created by the author using various sources.

Amir Abdul Rahman Khan's rise to power marked an intensification of authoritarian centralization and repressive policies, solidifying state control through coercion (Wafizada, 2013: 95). His efforts to establish a strong and centralized state were characterized by the systematic suppression of non-Pashtun ethnic groups and deliberate demographic engineering. While this approach expanded state control, it also deepened social divisions and fueled resentment (Taheri, 2022: 78). In the early 20th century, Amir Habibullah Khan and Amanullah Khan introduced reforms aimed at modernizing the state; however, these efforts remained confined within the same centralized framework. Mahmoud Tarzi played a key role in strengthening Pashtun ethnic nationalism during the reigns of Habibullah and Amanullah, including the institutionalization of Pashto as the national language, which heightened ethnic and linguistic tensions (Lee, 2019, p. 438). Rather than fostering national unity through ethno-cultural inclusivity, Afghanistan's state-nation building process was driven by the imposition of a singular identity and authoritarian centralization. This approach not only entrenched ethnic dominance but also led to profound and lasting social divisions.

The brief rule of Habibullah Kalakani marked the first direct challenge to Pashtun dominance in Afghanistan's state structure. However, with the restoration of the Nader Khan dynasty, policies of ethnic centralization and supremacy were reinstated. Nader Shah and later Zahir Shah, despite introducing some reforms, continued efforts to consolidate Pashtun identity, structuring state institutions to uphold ethnic dominance (Shahrani, 2013: 30). In the 1970s, the fall of the monarchy and the rise of Muhammad Dawood Khan did not alter this trajectory. His rule reinforced Pashtun ethno-nationalism and authoritarian centralization (Rasanayagam, 2007: 60-61). Dawood Khan's advocacy for the creation of "Pashtunistan" extended ethnic supremacist policies beyond domestic affairs, creating regional tensions, particularly with Pakistan. His administration's repression of opposition forces further escalated instability, ultimately leading to his overthrow in a communist coup in 1978.

Although the communist regime sought to replace ethnic nationalism with Marxist ideology, power remained concentrated in Pashtun hands. The radical reforms imposed by the communists, implemented with little regard for Afghanistan's complex social fabric, provoked widespread resistance and internal uprisings (Giustozzi, 2000: 70-71). With the fall of the communist government in the 1990s and the rise of the mujahideen, Afghanistan fractured into competing power factions. While Pashtun dominance faced challenges during this period, no viable alternative national framework emerged, leaving the country in a state of political fragmentation. The civil wars among mujahideen factions devastated Kabul (Giustozzi, 2000: 47) and created the conditions for the Taliban's rise to power. The Taliban combined Pashtun ethno-nationalism with religious ideology, reinstating ethnic supremacist policies and systematically suppressing non-Pashtun groups (Taheri, 2022: 79). While these policies imposed a temporary order, they failed to achieve national legitimacy and ultimately collapsed with foreign intervention.

Since the establishment of modern Afghanistan in 1880, the state-building process has undergone profound transformations, evolving from Amir Abdul Rahman's highly centralized and authoritarian rule to the fragmented and war-torn governments of the mujahideen and the Taliban. Throughout its history, Afghanistan has faced persistent crises in state formation, characterized by ethnic rivalries, authoritarian centralization, and the absence of genuine public participation. These structural weaknesses have consistently undermined the political system, contributing to the fragility of the state and the repeated collapse of successive governments.

As a multi-ethnic society, Afghanistan has encountered deep-rooted challenges in its nation-state formation. Rather than fostering inclusive institutions, the process has been driven by the consolidation of power by a dominant ethnic group and the systematic suppression of others. This approach has continuously undermined national solidarity and perpetuated a crisis of legitimacy.

In summary, Afghanistan's failure to build a stable nation-state stems from its persistent reliance on authoritarian nationalism, forced identity and linguistic assimilation, an overly centralized power structure, mismanagement of ethnic and cultural diversity, suppression of political elites, weak state capacity, and ethnic supremacy. These factors have not only obstructed national cohesion but have also made any attempt at inclusive nation-state building extremely difficult.

4. Findings: State- Nation Building in the Fragmented Society of Afghanistan (2001-2021)

After three decades of war and crisis, the Bonn Agreement (2001) laid the foundation for a new phase of state-building in Afghanistan. This agreement was significant because, for the first time, with international support, various political groups and parties (excluding the Taliban) reached a consensus on establishing a democratic government with proportional ethnic, geographical, and religious representation, alongside the inclusion of women (Hosseini Khani, 2011: 217-218). The 2004 Constitution was drafted with the objectives of state-building, institutional stabilization, and fostering national unity (Chagnizadeh and Sahraei, 2015: 80). This framework exhibited elements of political pluralism and reflected a model of unity within diversity. It granted formal recognition to ethnic identities, local languages, and both the Hanafi and Ja'fari jurisprudential traditions while embracing liberal democracy, multiparty politics, open electoral competition, and an emphasis on diversity in public administration (Arvin, 2013).

However, Afghanistan's state-building efforts encountered profound challenges due to its multi-ethnic composition, linguistic and religious diversity, and deep-rooted ethnic divisions. During this period, two key leaders, Hamid Karzai (2001-2014) and Ashraf Ghani (2014-2021), adopted different approaches in their attempts to establish a stable national government.

4.1 State-Nation Building During Hamid Karzai's Rule (2001-2014)

After the fall of the Taliban in 2001, Afghanistan, under Hamid Karzai's leadership, entered a new phase of state-building and nation-building, centered on ethnic representation and inclusion, the establishment of democratic institutions, and international support. This period witnessed both significant achievements and major challenges in governance, leaving a lasting impact on the country's political and social structure. One of the most notable accomplishments of this era was the drafting and ratification of the 2004 Constitution (Manochehri and Mazari: 2008: 308), which emphasized the legal equality of all ethnic groups and laid the foundation for a republican state based on democracy. This constitution provided a framework for key institutions, including the presidency, parliament, an independent judiciary, and electoral commissions, fostering broader citizen participation in political decision-making. In this context, Afghanistan held presidential elections in 2004 and 2009, as well as parliamentary elections in 2005 and 2010, contributing to the establishment of democratic legitimacy (Faraji Rad et al, 2011: 117). Although these elections faced challenges such as allegations of fraud, they nonetheless represented a major milestone as Afghanistan's first democratic experience following decades of war and instability. Another significant development during this period was the increased participation of women in government. For the first time, women were represented in parliament, the judiciary, and executive bodies, with a quota established for their presence in the legislative assembly (Grenfell, 2004: 22). While largely symbolic in nature, this measure marked an important step toward strengthening women's rights and increasing their visibility in Afghanistan's political and social spheres.

In addition to political advancements, the Karzai government, with the support of the international community, made substantial investments in infrastructure, education, health, and telecommunications. The development of the road network, the expansion of schools, universities, and medical centers, and increased access to telecommunications and internet services brought tangible improvements to people's daily lives. The government also secured billions of dollars in foreign aid by garnering the support of Western countries and international organizations. Conferences such as those in Bonn, Tokyo, London, and Chicago played a key role in ensuring continued assistance, positioning Afghanistan at the center of global political attention (Ramyar, 2012: 121).

However, the state-building and nation-building processes during this period encountered significant challenges that ultimately hindered the formation of a sustainable national state. Excessive centralization, government inefficiency in delivering public services, a lack of genuine ethnic participation, and weaknesses in the rule of law were among the key obstacles to consolidating a modern state in Afghanistan. Additionally, the government's heavy reliance on foreign financial and military support transformed it into a rentier state dependent on international aid, rather than fostering the growth of indigenous and popular institutions. Widespread corruption, lack of transparency, and poor resource management further undermined the government's legitimacy, fueling widespread dissatisfaction among the Afghan people. The escalating insecurity, the resurgence of the Taliban, and the government's inability to fully control the country highlighted deep structural issues within the state-building process.

In conclusion, while the Hamid Karzai era (2001-2014) was marked by efforts to establish democratic institutions, develop infrastructure, and expand political participation, structural challenges including corruption, excessive centralization, ethnic elite dominance, and heavy dependence on foreign aid prevented the creation of a stable and inclusive government. The main obstacles and challenges of state-building and nation-building during this period can be summarized as follows:

- 1) **Poor Management of Ethnic Diversity: From National Unity to Ethnic Divergence:** A key goal of Hamid Karzai's government was to foster national cohesion and incorporate Afghanistan's ethnic, linguistic, and religious diversity within a cohesive national framework (Yazdanpanah and Ahmadi, 2021: 321). The 2004 Constitution emphasized national unity, and the government sought to strengthen a shared national identity through language policies, state media, and the education system. However, in practice, these policies were largely symbolic. Rather than promoting national integration, they often exacerbated ethnic and identity-based rivalries, deepening ethnic divisions. As a result, instead of fostering national cohesion, the government struggled with increasing ethnic rivalries and political polarization. In this environment, the pursuit of sustainable national unity became increasingly elusive, and the government faced significant challenges in managing ethnic diversity and mitigating social fragmentation.
- 2) **Ethnic Oligarchy: From Political Participation to the Distribution of Power:** Initially, the composition of the Karzai government reflected Afghanistan's ethnic diversity, with representatives from various ethnic groups included in the government structure. However, this political participation was not based on a democratic and efficient system but rather on a coalition of power among ethnic elites (Sharan, 2016: 194). Instead of establishing sustainable democratic institutions where all ethnic groups could participate in decision-making through political and civil mechanisms, power became concentrated in the hands of a narrow circle of ethnic leaders and warlords. These leaders not only controlled economic and political resources but also tied the legitimacy of the state to their personal and group interests (Giustozzi, 2003: 15). Over time, rather than fostering genuine political inclusivity, this system evolved into a mechanism for distributing power and resources among ethnic elites. As a result, democratic institutions remained weak, and the state struggled to build national cohesion. The dominance of ethnic oligarchy prevented broader public participation in governance, eroded trust in state institutions, and contributed to long-term political instability.
- 3) **Centralization: Political Gridlock and the Gap Between the Center and the Periphery:** One of the most significant challenges to state-nation building during the Karzai era was the concentration of power within the political structure. Despite calls from various ethnic and political groups for decentralization, the Karzai government insisted on maintaining a highly centralized presidential system. Rather than strengthening national sovereignty and fostering social cohesion, this policy exacerbated the divide between the central government and the peripheral regions (Qadam Shah, 2021). The concentration of power in Kabul persisted despite the government's limited institutional capacity to govern effectively across the entire country. Many remote areas remained underserved, lacking government services, security, and economic development. This created a sense of alienation from the central government, leading to a decline in public trust. As a result, various ethnic groups and local communities sought non-state alternatives to address their needs. These alternatives included ethnic leaders, local networks, and even armed groups, which played a more prominent role in managing local affairs in the absence of an effective government presence. Ultimately, extreme centralization and the failure to create an inclusive,

participatory system led to political gridlock and deepened social divisions, preventing the government from establishing an accountable and sustainable governance structure.

- 4) Government Inefficiency: Institutional Failures and the Spread of Structural Corruption:** Government efficiency is a key indicator of success in the state-building process. However, during the Hamid Karzai era, the weakness of state institutions and the pervasive corruption within the government hindered the creation of an efficient and accountable system. Despite the influx of billions of dollars in international aid, these resources were often funneled through narrow circles of power and networks of corruption, rather than being used to strengthen state infrastructure or promote national development¹. Corruption took root not only within executive and judicial institutions but also eroded the legitimacy of the state in the eyes of its citizens. In such an environment, many people viewed the state not as a national institution serving the public, but as a system for distributing privileges among political and economic elites. In other words, instead of building a modern, transparent, and efficient state, the government structure evolved into a network of informal, rent-seeking relationships that significantly influenced decision-making and governance to serve the interests of specific groups. As a result, the institutional reforms needed for state-building were never fully realized, and inefficient structures and systemic corruption became entrenched within the state during this period.
- 5) Weak Rule of Law: The Challenge of Establishing a Sustainable Legal Order:** Establishing an independent judiciary and enforcing the rule of law were among the core objectives of state-building during the Karzai era. However, these goals faced serious structural and implementation challenges. The influence of warlords and power brokers, weak law enforcement, and the absence of an effective oversight system prevented the fair and consistent administration of justice. Consequently, the judiciary was often manipulated to serve the interests of specific groups rather than functioning as an impartial institution. In many regions, traditional and informal courts replaced the formal judicial system because the public lacked trust in state courts. Many citizens turned to ethnic leaders and alternative networks, including the Taliban, to resolve disputes, further weakening the state's authority to provide justice. This erosion of judicial credibility not only undermined the legitimacy of the government but also deepened public distrust in legal institutions. Rather than establishing a transparent and independent judiciary, the state became entangled in political considerations, administrative corruption, and pressure from influential groups, which severely compromised the enforcement of the rule of law (Yaqubi and Hussainy, 2025: 24). The inability to create a stable and credible legal order was a key factor in the failure of the state-building process and laid the groundwork for future crises.

As a result State-Nation building during Hamid Karzai's era was characterized by deep structural contradictions and institutional failures. On the one hand, the government emphasized ethnic participation and national unity, but in practice, participation was largely limited to an alliance of ethnic elites and warlords. On the other hand, power remained centralized, yet without the establishment of effective institutions capable of justifying this concentration of authority. The failure to manage ethnic diversity led to the dominance of an ethnic oligarchy within the state structure. Centralization further widened the gap between the center and the periphery, while corruption and institutional inefficiency

¹ According to the SIGAR report, which reviewed the period from 2009 to 2019, approximately \$19 billion of U.S. aid allocated for the reconstruction of Afghanistan was wasted (SIGAR, 2020).

escalated. At the same time, the judiciary lost its independence and legitimacy, making the rule of law increasingly fragile. Collectively, these factors not only intensified ethnic fragmentation and social distrust but also paved the way for recurring political crises.

4.2 State-Nation Building During Ashraf Ghani's Rule (2014-2021)

In the discussion section, the conclusions of the current study are compared with the conclusions of similar studies in the literature while interpreting the possible reasons for the conclusions. Ashraf Ghani came to power with the promise of establishing a modern, technocratic, and non-ethnic-based government. His vision was to rebuild the decision-making system using scientific management principles and modern institutions. Ghani's key objectives included reducing the influence of warlords, combating corruption, and improving government efficiency. During his tenure, several financial and administrative reforms were introduced, including digitizing the tax system, reducing dependence on foreign aid, and increasing domestic revenue. Additionally, significant investments were made in infrastructure, particularly in transportation, energy, and regional trade projects such as TAPI (BBC, 2017) and CASA-1000 (Etilaatroz, 2020). At the same time, Ghani attempted to weaken the role of warlords in politics and professionalize the security forces by removing non-professional commanders.

However, in practice, these policies failed to create an inclusive and effective government. Instead, Ghani adopted an increasingly centralized approach, concentrating power within the presidency and making key decisions without broad consultation with political and social institutions. This led to widespread dissatisfaction among various ethnic groups, political factions, and even his own allies. The distribution of government positions was also highly selective, favoring a small circle of close advisors. As a result, many ethnic and political groups felt excluded and discriminated against, deepening ethnic divisions and social fragmentation.

Although the Ghani administration initially advocated for anti-corruption measures and administrative reforms, corruption both financial and administrative—remained entrenched within government structures. The failure to ensure justice and effectively combat corruption further eroded public trust in the state.

Security management was another major challenge. As Taliban attacks escalated and foreign troops withdrew, the government failed to effectively mobilize security forces. Strategic miscalculations in the war, growing public distrust, and poor coordination among security institutions contributed to the rapid Taliban takeover. Kabul fell in 2021 with little resistance, marking the collapse of the Afghan government. In the end, Ghani's tenure, which began with ambitious promises of reform, modernization, and anti-corruption efforts, resulted in an excessively centralized government, increased ethnic polarization, ineffective security management, and ultimately, the fall of the state. Instead of achieving meaningful reforms, his administration deepened Afghanistan's structural crises and set the stage for its eventual downfall. The key challenges of state-nation building during Ghani's administration can be summarized as follows:

- 1) **From Imposing Identity to Extreme Centralization:** Ashraf Ghani's policies aimed to establish a unified national identity and consolidate power within the central government. He sought to standardize national identity by officially designating "Afghan" as the identity of all citizens on electronic ID cards (Radio Azadi, 2018) while implementing administrative changes to reinforce this policy. At the same time, he pursued extreme centralization of power (Shahrani, 2018). Hamid Karzai engaged with ethnic leaders, whereas Ashraf Ghani limited decision-making to a small

group of technocrats within the Arg (Presidential Office). This inner circle made key decisions with minimal consultation with broader political and social movements, exacerbating dissatisfaction and alienation among various ethnic and political groups. Instead of fostering national unity, these policies deepened mistrust and social divisions, ultimately weakening the legitimacy of the state. The excessive concentration of power in the presidency, disregard for the concerns of ethnic and political factions, and unilateral decision-making moved the government away from an inclusive, national approach paving the way for future crises.

- 2) **From Ethnic Inclusion to the Restoration of a Mono-Ethnic State:** Despite his rhetoric about building an inclusive state, Ashraf Ghani increasingly pursued policies favoring ethnic exclusivity. He appointed individuals from his close circle to key positions in the government, security, and military while sidelining experienced commanders and officials from diverse ethnic backgrounds. These actions alienated various ethnic groups, diminishing the state's legitimacy among different tribes and political factions. His efforts to restore a predominantly Pashtun state became evident in his focus on consolidating power within his own ethnic group while gradually excluding others from key institutions. By systematically favoring Pashtuns for strategic government positions and marginalizing non-Pashtun commanders (Ayoobi, 2018), Ghani weakened the foundations of participatory governance. These policies fueled ethnic distrust and, over time, contributed to the collapse of his government.
- 3) **From the Promise of Structural Reforms to the Collapse of the Government:** Ashraf Ghani rose to power with promises of implementing structural reforms, creating an efficient and transparent government, and applying scientific management to governance. He emphasized that reducing corruption, modernizing the administration, and eliminating warlord influence would establish a modern, functional state. However, in practice, excessive centralization of power within a small elite, widespread corruption², and poorly coordinated policies led to government inefficiency and growing public discontent (Shafiq, 2018). During Ghani's tenure, the presidency's dominance over state affairs and unilateral decision-making marginalized other political institutions and movements. The lack of meaningful participation from diverse ethnic and political groups led many to feel excluded, further exacerbating social divisions. These policies not only failed to foster national cohesion but also intensified ethnic tensions and public distrust. Meanwhile, mismanagement and corruption within state institutions further eroded confidence in the government. Despite receiving billions of dollars in international aid, a lack of transparency in fund allocation and the exploitation of resources by powerful elites fueled public frustration. Additionally, the government's failure to manage the security crisis—especially as the Taliban insurgency intensified—left it increasingly vulnerable. As dissatisfaction mounted and international support waned, Ghani's government became progressively isolated.

Finally, in August 2021, amid a swift Taliban offensive and the collapse of state institutions, Ghani fled the country without informing many of his top officials. This abrupt departure marked the sudden and dramatic fall of his regime. The experience of Ghani's government underscores that sustainable nation-building in multi-ethnic societies requires a balance between centralization and

² According to Transparency International's annual report in 2018, Afghanistan ranked as the fourth most corrupt country in the world, following Somalia, South Sudan, and Syria. Furthermore, in 2021, the Organized Crime and Corruption Reporting Project (OCCRP) included Ashraf Ghani in its final list of the world's most corrupt individuals (Hasht Sobh, 2024).

participatory governance, recognition of identity plurality, and adherence to the rule of law. His failure to uphold these principles ultimately drove his government into crisis and led to its downfall.

A comparison of two decades of nation-state building in Afghanistan under the leadership of Hamid Karzai and Ashraf Ghani reveals distinct approaches to governance and nation-state building. Although the nation-state building process received international support following the fall of the Taliban in 2001, Karzai's (2001–2014) and Ghani's (2014–2021) administrations took divergent paths. Key factors such as the management of ethnic diversity, national participation, state-building strategies, government effectiveness, and the rule of law played crucial roles in shaping the outcomes of each administration.

Table 1. A Comparison of Hamid Karzai and Ashraf Ghani's Leadership

| Indeks | Hamed Karzai(2001-2014) | Ashraf Ghani(2014-2021) |
|---------------------------------------|--|--|
| Type of Government | Presidential | Presidential |
| Nation-State Building Approach | Restructuring, creation of state institutions | Institutional reforms and centralization |
| Ethnic Policy | Relatively egalitarian pluralism | Inegalitarian Pluralistic |
| Participation of ethnic groups | Relative participation of ethnic groups (Maintaining ethnic balance) | Gradual elimination of other ethnic groups (Pashtunism) |
| Decision Making System | Traditional Consensus | Centralism and exclusiveness |
| Achievements | Establishing the constitution, holding elections, democratic transfer of power | Institutional reform efforts, Efforts to become self-sufficient |
| Failures | Over-dependence on foreign aid, widespread corruption and the strengthening of the Taliban | The escalation of the war, the collapse of the army and finally the fall of the government |

Source: It was created by the author using various sources.

As shown in the table above, the state-building period under Hamid Karzai is considered successful in reviving state institutions, passing a modern constitution, establishing a parliament, and founding the national army and police. However, heavy reliance on foreign aid and widespread corruption undermined the government's efficiency. In contrast, Ashraf Ghani sought to improve bureaucracy and reduce dependency on foreign aid³. However, due to corruption, weak management, and declining public trust, he failed to achieve these goals. The rapid collapse of Ghani's government in 2021 demonstrated the ineffectiveness of these efforts, as state institutions proved unable to survive without foreign support.

Regarding ethnic policy, Hamid Karzai attempted to maintain ethnic balance through engagement with ethnic leaders, although power remained primarily concentrated among the Pashtuns. In contrast, Ashraf Ghani pursued a policy of ethnic centralization and a more homogeneous ethnic approach, which fueled distrust and division. This led to widespread protests against his government, such as the "Light Movement" and the "Resurrection Movement."

In terms of public participation, Karzai's tenure witnessed two presidential and parliamentary elections, as well as the expansion of media and civil society. Although some degree of public participation in governance was achieved, election fraud diminished public trust. Under Ghani, electoral fraud became even more widespread, and his ethnocentric policies deepened political and social divisions, exacerbating public frustration.

Regarding decision-making, Karzai often consulted ethnic leaders and warlords, making decisions through political compromise. In contrast, Ghani adopted a highly centralized and unilateral decision-making approach, which contributed to the government's collapse due to its authoritarian tendencies. Ultimately, neither administration succeeded in creating an inclusive and sustainable state for all ethnic groups in Afghanistan, leading to the failure of the nation-state building project in the country.

5. Conclusions

For decades, the process of building a modern nation-state in Afghanistan has faced persistent obstacles, preventing the establishment of a stable and sustainable governance system. Despite various internal and external initiatives across different historical periods, Afghanistan continues to grapple with fundamental challenges in state-nation building. From the reign of Amir Abdur Rahman in the late nineteenth century to the Taliban regime, the state structure has been characterized by centralization, enforced homogenization, and ethnic dominance. Even the intermittent reforms introduced by Amanullah Khan and Zahir Shah failed to disrupt this pattern.

Following the fall of the Taliban in 2001, Afghanistan, with international support, embarked on the path of establishing a modern and democratic state. During Hamid Karzai's tenure, new state institutions were established, and a constitution was adopted. However, widespread corruption, centralized governance, and the mismanagement of ethnic diversity hindered the development of an inclusive and stable political system. Under Ashraf Ghani, efforts at administrative reform and reducing dependency

³ The report by the Special Inspector General for Afghanistan Reconstruction (SIGAR) indicates that the United States spent approximately \$145 billion on Afghanistan's reconstruction between 2002 and 2020. This substantial figure clearly reflects Afghanistan's deep dependency on foreign aid during the past two decades (SIGAR, 2020).

on foreign aid were undermined by ethnically driven policies and excessive centralization, further deepening social divisions and ultimately culminating in the collapse of the state in 2021.

The two-decade experience of state-building in Afghanistan demonstrates that stability in a multi-ethnic society requires embracing identity diversity, ensuring meaningful participation of all ethnic groups, and strengthening independent and efficient institutions. The failure to address ethnic tensions, combat corruption, and implement transparent governance led to the breakdown of the nation-building project and exacerbated the legitimacy crisis. This experience highlights that only through respect for ethnic diversity and broad-based participation can Afghanistan progress toward a democratic and sustainable state.

Looking ahead, several measures can contribute to the establishment of a stable and inclusive governance system. Revisiting the structure of governance and adopting a decentralized system that ensures ethnic representation can help reduce tensions and foster public trust. Strengthening state capacity by combating corruption and enhancing transparency is crucial for effective governance. Judicial and administrative reforms, independent oversight mechanisms, and a stronger civil society are essential for promoting accountability and institutional efficiency. Additionally, redefining national identity in an inclusive manner that fosters a sense of belonging among all ethnic groups is imperative. Identity policies should embrace cultural plurality rather than impose a singular national identity. Furthermore, promoting economic development and reducing reliance on foreign aid through job creation and infrastructure investment can enhance long-term stability and mitigate public dissatisfaction.

Ultimately, Afghanistan requires profound structural reforms, transparent governance, and an approach centered on justice and meaningful participation to transition toward an inclusive and stable nation-state. Only through these measures can the foundations for building a unified society rooted in shared identity and collective participation be established, ensuring the long-term success of the nation-state-building process in Afghanistan.

6. Declarations

6.1. Competing Interests

There is no conflict of interest in this study.

6.2. Authors' Contributions

Authors declare that they have contributed equally to the work.

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