INVESTIGATION OF THE EFFECT OF RISK PERCEPTIONS OF THE GENERATION Z CONSUMERS' AGAINST REFURBISHED PRODUCTS ON THEIR PURCHASE INTENTION

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Type of manuscript: research paper

Abstract: *Changes in the consumption culture of individuals, the economic problems experienced and the increase in environmental awareness cause significant increases in the sales of refurbished products, especially technological devices. While the growth of the refurbished product market contributes to consumers having these products at more economical prices, it also contributes to the reduction of the production costs of the enterprises and, from an environmental point of view, to the prevention of possible waste and damages that may arise during the production of new products. Therefore, it would not be wrong to argue that the sales of refurbished products will increase gradually and to predict that the refurbished product market will grow by diversifying. The present study investigates the effect of perceived risk dimensions of young consumers living in Turkey on their intention to purchase refurbished products. The reason why the Z generation was chosen in the study is to learn the buying habits of new or renewed products in technological products and to examine their attitudes towards refurbished products as a generation born and grown up in technology. Another reason for the selection of the Z generation in the research is that the Z generation, which constitutes an important part of society in Turkey, directs technological trends. It is thought that the findings of the research will make significant contributions to the marketing decisions of the companies producing technology for the Z generation, lawmakers and researchers. The research was carried out between January and March 2022 with 415 participants living in Istanbul, Turkey's largest city, determined by the convenience sampling method. In this research, regression analysis was used to test the hypotheses. The research was carried out with 415 participants. As a result of the research, it was determined that social risk has a low positive and significant effect on the effect of perceived risk dimensions of Generation Z consumers on the purchase intention of the refurbished product, performance risk has a low negative significant effect, psychological risk has a good positive and significant effect, time risk has a low positive significant effect, and physical risk has a low negative and significant effect. These results show that the psychological risk perception of Z generation consumers is important in their renewed product preferences. For this reason, companies should be careful to offer products that meet the expectations of consumers for refurbished products and not disappoint Z generation consumers.*
Keywords: Turkey; refurbished product; perceived risk; technology.

1. Introduction. It is accepted by everyone that increasing industrialization and resource consumption threaten the world we live in. Therefore, the economical use of resources and the prevention and reduction of pollution at the source during the production process are of great importance for a sustainable environment. At this point, governments, companies and societies have understood that the way to eliminate wastage and reduce the negative effects of waste on society is only possible by a circular economy. The circular economy is a process that transforms wastes into economic value by including them in the production process through appropriate processes instead of disposal (Balbay et al., 2021). It is thought that the carbon footprint of consumer electronics, which is the most important element of the refurbished product market, can be reduced by 87% if it is refurbished and resold instead of producing new ones (Blomsma & Tennant, 2020).

In addition to the development of the circular economy concept, the climate change problems caused by excessive consumption, the problem of scarcity of resources, the economic problems experienced and the development of environmental awareness undoubtedly cause significant changes in the consumption decisions of individuals. These emerging developments bring along significant increases in the sales of refurbished products. By bringing used or damaged products to the economy through product refurbishment, the possible wastes that may occur in the production of new products and the damage to the environment are significantly reduced. Therefore, it is considered that important benefits are provided to the production business by enabling them to produce a new product with less cost and by enabling consumers to purchase products at affordable prices through refurbished products as well as the benefits to the environment by recycling inert products (Ecevit & Duman, 2022). The growth of the refurbished product market will undoubtedly be possible with the increase in consumers' demand for refurbished products, that is, with the acceptance of refurbished products by consumers (Cudok et al., 2022). Therefore, within the scope of this research, the main objective was to offer suggestions that will increase the acceptance of these environmentally friendly sustainable products, make them more acceptable to potential users, disseminate refurbished products and contribute to a more sustainable worldview. In this context, learning the attitudes of consumers towards the risk factors they face in the process of shopping for refurbished products will undoubtedly shed light on the policies to be developed by brands and companies. Therefore, it is thought that this research will make important contributions to the brands and companies operating in the refurbished product sector and to the researchers working in this field.

2. Literature Reviev. In this section, the Z generation, the concept of refurbished products, shopping for refurbished products in Turkey and around the world, and the risks faced by consumers when choosing a refurbished product are discussed.

2.1 Generation Z. The birth dates of individuals are taken into account in determining the generations in consumer behavior studies related to generations. In this context, Baby Boomers are classified as those born between 1946-1964, Generation X as those born between 1965-1979, Generation Y as those born between 1980-1994, and Generation Z as those born between 1995-2009 (Goh & Lee, 2018). Generation Z individuals, who are the subject of the research, opened their eyes to a world with the internet and have never lived without the internet. In addition, the approval and acceptance of friends is of great importance for the members of this generation. The self-concept of Generation Z individuals, who value authenticity and reality, is shaped by the group to which they belong. Individuals belonging to Generation Z are seen as a generation that meets different experiences and ideas on a global scale, as they use the internet easily. Due to their unique characteristics and the world conditions they were born into, much research has been done recently on Generation Z individuals. Generation Z individuals actively use social media and attach great importance to the active use of social media by brands, offering them the opportunity to shop through digital applications (Gumus, 2020).

2.2 Concept of Refurbished Product. Although the literature on product refurbishment continues to evolve, the concept of refurbished products appears to be defined in different ways. In the literature, product refurbishment is defined as bringing used products to a certain quality level, although not brand-new, while remanufacturing is defined as bringing used products to the quality level of brand-new products (Ecevit & Duman, 2022). Refurbished products are defined as products that are collected and then resold after they are used, tested, cleaned and brought to an acceptable condition by the previous owner (Pigosso et al., 2013). Refurbished products refer to products that are disposed of for various reasons or returned to the business, then revised by the manufacturers and made new after maintenance and repair of missing or damaged parts. In refurbished products, the product is restored to its original condition without upgrading, which may result in lower performance than a new product (King & Burgess, 2005). However, refurbishing the products and bringing them back to the use of consumers is seen as an effective cyclical strategy to extend the life of a product (Wallner et al., 2020).

It usually comes with product warranties and a 20 to 40 percent lower price tag than an equivalent brand-new product. The refurbished electronics market is growing rapidly; for example, the refurbished mobile device market is expected to reach an estimated $140 billion by 2030 and grow at almost twice the rate of "new" smartphones.

Therefore, it would be appropriate to first look at the reasons for the return and disposal of the products. In a study on the subject, these reasons are stated as follows (Vorasayan & Ryan, 2006):

- The quality of the product in its current state does not meet the expectations of the customer (this category also includes various reasons, such as customers not being able to use the products, finding a better price, overordering or regretting).
- After reviewing and testing by editors or vendors, a return decision is made.
- Damage to product packaging.
- The product cannot perform its specified functions.
- The expiration of the rental period of the product.
- Product disposal by consumers.

Although refurbished products are less demanded because they have been used previously, there is a perception that they are of lower quality, have lower performance and have a less attractive appearance (Wallner et al., 2020).

2.3 Refurbished Product Shopping in the World and Turkey. The popularity of refurbished devices has been growing in recent years in many cost-conscious countries around the world, as they are offered at 40% to 60% lower prices than new products. The market size of refurbished electronic products was 85.42 billion in 2021, and it is estimated that this number will reach 272.91 billion dollars by the end of 2031. In the categories of smartphones, wearable devices, computing devices, home appliances, audio and video devices and game consoles, the refurbished product market, which has developed under the leadership of brands such as Acer, Dell, Apple, HP, Overcart, Amazon, Asus and Lenova, is expected to increase further in the years to come with the increase in the product diversity of the brands. Another reason behind the growth story of the market is that lower- and middle-income groups in developing countries will have more demand for refurbished products (TMR, 2022).

India stands out in the refurbished product market. Due to massive remanufacturing investments, most Indian companies are dealing with either refurbishment or recycled products. Additionally, refurbishment is cheaper, as only worn or obsolete parts are replaced. Therefore, refurbished products are popular among Indian companies, and consumers also prefer them because of their lower price (Gaur et al., 2017). Regarding smartphones, which are the leaders in the refurbished product market, worldwide sales of refurbished smartphones are reported to have increased significantly since 2010. In 2014, 56 million refurbished smartphones were sold to end users worldwide. Total sales revenue of 7 billion dollars was obtained from this sale. Similarly, refurbished smartphone sales increased to 140 million units in 2017 and more than doubled in three years, generating $14 billion in sales revenue (Hazelwood & Pecht, 2021). In research conducted in Indonesia, it was stated that young participants may switch to a refurbished smartphone rather than buying a mid-range smartphone if the refurbished smartphone provides more benefits to them (Halim et al., 2022).

In Turkey, on the other hand, there has been a serious increase in the prices of electronic products due to the rise in exchange rates. This increase has caused consumers to turn to refurbished products instead of new products. In this context, the "Regulation on the Sales of Refurbished Products" was published with the "President Decision No. 4517" published in the Official Gazette dated 30.09.2021 regarding refurbished products. In this context, the scope of'refurbished products' was expanded from the previous limitations of mobile phones and tablets. Accordingly, with the Regulation published in the Official Gazette dated 18.04.2023 and numbered 32167, smart watches, computers (laptops, desktops), game consoles and modems are also included in the scope of refurbished products.

2.4 Factors Influencing the Decision to Purchase a Refurbished Product Undoubtedly, there are many factors affecting consumers' preference for refurbished products. This is also revealed by the research on the subject. For example, a study conducted in the USA shows that the level of environmental awareness, individual values, postuse perceptions, quality of purchase and sociocultural norms are the main reasons. The research revealed that consumers give refurbished products as much as new products (Gaur et al., 2014). However, it is determined in research that consumers purchase refurbished products because of their environmental benefits (Michaud & Llerena, 2011). Young consumers, in particular, will purchase more refurbished products if their eco-friendly features are emphasized and properly marketed. In this context, marketing tools such as eco-labelling, environmental advertising and eco-branding can create a positive

perception in consumers of environmentally friendly products (Rahbar & Wahid, 2011). In a study on the subject, it was determined that product features, reliability, reviews/support, refurbishment process and ecological factors are effective in purchasing decisions regarding refurbished products (Gaur et al., 2022). In the same research, it was revealed that young consumers prefer environmentally friendly products that reduce their carbon footprint, reduce electronic waste, reduce waste, reduce toxic emissions and conserve resources. In another study, it was stated that refurbished products are preferred by consumers because they are sold at a lower price and have high environmental benefits (Mahmoodi & Haydari, 2021).

Studies show that the perception of quality and price advantage for refurbished products are the two most important drivers of demand for refurbished products (Abbey et al., 2015).

In a study conducted in 2018 on the subject, the effect of product knowledge, perceived usefulness, perceived risk, and purchasing attitude on the intention to purchase a remanufactured mobile phone was revealed (Wahjudi et al., 2018). Again, in a study on refurbished smartphones, it was emphasized that it would be important for companies to offer financial advantages such as discounts or installment programs and to increase the performance characteristics of their products to increase the likelihood of consumers purchasing refurbished smartphones. In the same study, it was stated that it would be beneficial to increase after-sales services by companies to help reduce the risk perception towards refurbished smartphones (Halim et al., 2022). In another study, the factors that most affect the intention to purchase refurbished products were determined to be subjective norms, environmental awareness, quality perception, benefit perception and risk perception (Ecevit & Duman, 2022).

As a result, for the consumer, purchasing refurbished products is an economical way to obtain products that perform as well as new ones. For the manufacturer, refurbished products allow the expansion of the market by convincing the consumer, who is not willing to pay high prices, to purchase refurbished products cheaper. However, there may be intersections between markets for new and refurbished products. Consumers in this intersecting market will choose between a new or refurbished product based on price and perceived quality. In countries such as Turkey, where technology products are imported at high prices, refurbished products are much more preferred due to the price advantage.

2.5 Consumer Concerns in Preferring Refurbished Product. Consumers may be afraid of making a bad financial investment (financial risk) by purchasing refurbished products that may not work satisfactorily (functionality risk) and have to be returned, resulting in a waste of time (Baxter et al., 2017). Similarly, some consumers may tend not to purchase refurbished products because they look used/contaminated as a result of their previous use (Wallner et al., 2020).

It should be natural for consumers to have some concerns about refurbished products. Although the refurbished product market continues to grow, some problems have increased the concerns of other consumers. Concerns experienced by consumers are summarized as follows in a study (Abbey et al., 2015):
- Quality Concerns: Do remanufactured products truly work "like new"?
- Reluctant Consumers: Only new products are good enough.
- Green Consumers: Is reproduction green?
- Disgusted Consumers: The remanufactured product is tarnished forever.

As a result, it is clear that technological devices undergo different levels of refurbishment that consumers are often unaware of, that the environmental advantages of refurbished devices often outweigh their disadvantages and that refurbished electronics will never be as reliable as new products. Therefore, it is of great importance to carry out intensive marketing efforts to set standards for refurbished products, especially smartphones, and to build trust in refurbished devices.

2.6 Financial Risk. Financial risk faced by consumers refers to the monetary losses experienced during the purchase by the consumer who buys any goods or services (Onurlubas & Gumus, 2022). Financial risk also means consumers' perceived risk of loss of economic investment or additional costs to repair or replace the purchased product if there is a problem (Horton, 1976). It is a situation of losing money by purchasing an inadequate or unknown brand. However, this definition can be extended to include the risk that the quality of the product does not match its price. The fact that the product has been used before in secondhand clothing shopping may cause the risk of not providing the expected performance, and the expectation that the performance will not be worth the money can cause risk perception. Since the money paid may vary depending on the quality of the refurbished product, the severity of the perceived financial risk may also vary (Cakır & Dedeoglu, 2020).

Financial risk refers to the fear that the relatively high money paid for a refurbished phone is not well spent and will have a negative impact on the consumer's monetary resources (Weelden et al., 2016). Consumers are generally willing to pay less for refurbished products and have lower purchase intention. In addition,

consumers think that refurbished products are a riskier choice or find it uncomfortable to touch a refurbished product due to physical or digital traces that an old user may have left on the product (Wallner et al., 2020). Accordingly, the following hypothesis was formed:

H1: Perceived financial risk in refurbished product purchases has a significant effect on consumers' purchase intentions.

2.7 Physical Risk. Physical risk can be expressed as the possibility of adversely affecting the health or physical structure of the consumer due to the purchased product (Odabası & Barış, 2011). Physical risk characterizes the mental energy and effort of consumers while purchasing products that threaten their health and physical structure. The quality of the products, the comfort and safety of the store, and the parking spaces are related to physical risk. Perceived physical risk refers to the possibility that products are harmful to individuals' health or that products do not look as good as individuals expect (Yuce, 2014). Accordingly, the following hypothesis was formed:

H2: The perceived physical risk in refurbished product purchases has a significant effect on consumers' purchase intentions.

2.8 Psychological Risk. Psychological risk, which is another perceived risk factor that consumers face in their shopping, is the mental stress experienced by consumers while purchasing a good or service or the disappointment of shopping (Bashir et al., 2017). It would not be wrong to express psychological risk as situations that are felt entirely emotionally and that are likely to experience disappointment, anxiety and stress instead of the pleasure, fame and similar situations that consumers expect from the goods or services they purchase (Can & Cakar, 2019). Accordingly, the following hypothesis was formed:

H3: The perceived psychological risk in refurbished product purchases has a significant effect on consumers' purchase intentions.

2.9 Performance Risk. Performance risk refers to the fear that a refurbished phone will have lower functionality or a short lifespan. Another disadvantage of refurbished products is their aesthetic appearance; refurbished products are often considered to have a less attractive appearance than new products for two reasons. First, refurbished products may not have the desired new look and may not follow the latest trends. Second, wear and tear marks can make the product less attractive because these marks remind the user of previous use of the product and thus trigger negative connotations that the product may not function as well as a new product (Weelden et al., 2016). Accordingly, the following hypothesis was formed:

H4: Perceived performance risk in refurbished product purchases has a significant effect on consumers' purchase intentions.

2.10 Social Risk. Humans are social entities. Therefore, they are in constant interaction with other individuals. Therefore, it is inevitable for the individual to affect others with his views and to be affected by the views and thoughts of other individuals. In this case, the perception of social risk emerges (Onurlubas & Gumus, 2022). Social risk refers to a consumer's disappointment with the purchase of any good or service, losing status in his social group, and not being accepted by society (Featherman & Pavlou, 2003). Social risk is defined as the negative influence of the choices made by the individual by his or her relatives, friends, family or people around him or her (Tanrıkulu & Bakır, 2021). Accordingly, the following hypothesis was formed:

H5: The perceived social risk in refurbished product purchases has a significant effect on consumers' purchase intentions.

2.11 Time Risk. One of the perceived risk dimensions is time risk. Time risk refers to the inconvenience and loss of time experienced while searching for the product (Pathak & Pathak, 2017). Time risk refers to the fear of losing time when refurbished devices fail to deliver the promised facilities or have to be returned for maintenance (Weelden et al., 2016). Time risk refers to the regrets that consumers will experience because they waste their time as a result of the bad purchase they make with their research to buy a refurbished product instead of buying a new product. Accordingly, the following hypothesis was formed:

H6: Perceived time risk in refurbished product purchases has a significant effect on consumers' purchase intentions.

3. Methodology and research methods. The refurbished product market has gained importance today due to the increase in environmentally friendly consumption trends, the spread of sustainability concerns, and cost savings. This study aims to reveal the effect of the perceived risk dimensions of Generation Z consumers living in Istanbul on their intention to purchase refurbished products. In this context, the problem of the research is how does the perceived risk dimensions of Z generation consumers for refurbished products affect their purchasing intentions for refurbished products? can be expressed as

3.1 Scope of the Research and Sampling This study was carried out in Istanbul between January and March 2022. Among the nonrandom sampling methods, the convenience sampling method was used as the data collection method. In this research, a face-to-face questionnaire was administered to a total of 415 participants in generation Z who were born in and after 2000. A 5-point Likert scale was used for questions about the scale in the questionnaire. Evaluation on a 5-point Likert scale was coded as (1) Strongly disagree, (2) Disagree, (3) Undecided, (4) Agree, and (5) Strongly agree.

3.2 Analysis of data. The first part of the questionnaire included demographic questions. In the second part, there are questions to measure the effect of factors such as social risk, performance risk, perceived risk, time risk, financial risk, psychological risk, and physical risk on purchase intention. Data analysis in the research was carried out using the SPSS package program. In this study, Cronbach's alpha coefficient was used to evaluate the reliability level of the scales. The Cronbach alpha coefficient is a statistical method that measures the internal consistency of a scale. In general, values greater than 0.70 represent a good level of reliability, and values between 0.60 and 0.70 represent an acceptable level of reliability (Hair et al., 2010).

In this study, the Cronbach alpha value was calculated to be 0.839 as a result of the reliability analysis of 23 statements used to measure the dimensions of perceptual risk. This value shows that the scale is reliable at a good level. In addition, as a result of the reliability analysis of the scale used to measure purchase intention, the Cronbach alpha value was found to be 0.875, which indicates that the scale is reliable at a good level. Reliability analysis was applied to evaluate the internal consistency of the scales before starting the factor analysis, and the results were found to be satisfactory in terms of reliability. Among the scales used in the research, the scales of perceived risk dimensions of purchase intention were created by adapting from the studies of various researchers (Wang et al. 2018; Cakır & Dedeoglu, 2010; Argo et al., 2006; Hassan et al., 2006).

In this study, a normality test was performed to determine whether the data had a normal distribution. The normality test examines the skewness and kurtosis values of the data groups. According to the literature, groups with skewness and kurtosis between +2 and -2 are considered to have a normal distribution (George & Mallery, 2003). As a result of the normality test performed in this study, it was determined that all tests in the study showed a normal distribution. Therefore, it was deemed appropriate to use parametric tests in the analyses.

To test the hypotheses of the research, first, the Pearson correlation coefficient was calculated to examine the relationship between social risk, performance risk, perceived risk, time risk, financial risk, psychological risk, physical risk and purchase intention. Then, multiple regression analysis was applied to determine the factors affecting social risk, performance risk, perceived risk, time risk, financial risk, psychological risk, physical risk and purchase intention.

4. Results. In this section, there are demographic characteristics of the participants, purchasing habits of renewed products, validity and reliability analyses of the scales used in the research, factor analyses of the scales, correlation analyses and the results of the regression analysis in which the hypotheses were tested.

Table 1. Demographic characteristics of participants

Gender	F	%
Female	187	45.1
Male	228	54.9
Monthly Average Income Per capita	**F**	**%**
750 TL and less	42	10.1
751 TL-1000 TL	78	18.8
1001 TL-1250 TL	20	4.8
1251 TL-1500 TL	64	15.4
1501 TL-1750 TL	34	8.2
1751 TL-2000 TL	31	7.5
2001 TL and more	146	35.2
Total	415	100.0

Sources: developed by the authors.

When Table 1 is examined, it is seen that 54.9% of the participants in the research are men and 45.1% are women. When the income distribution of the participants is examined, it is seen that those with a monthly average income per capita of 2001 TL and above are in the majority.
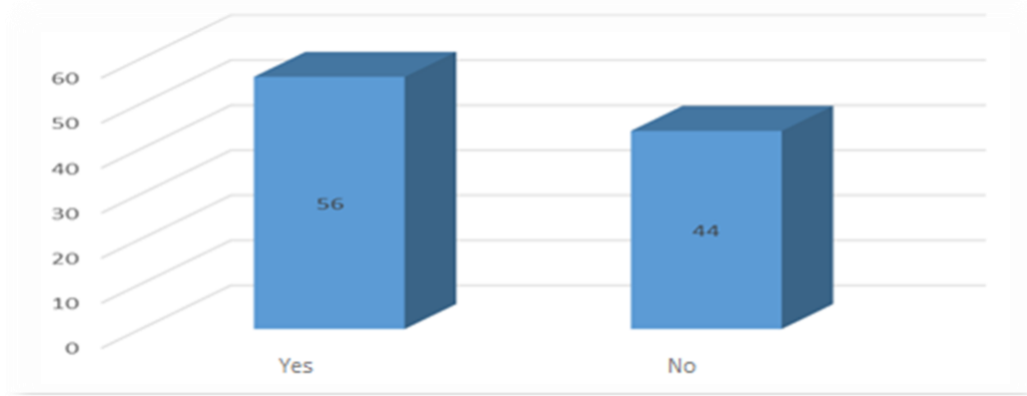
Figure 1. Refurbished product purchase status
Sources: developed by the authors.

According to the research, 56% of consumers purchase refurbished products, while 44% do not purchase these products.
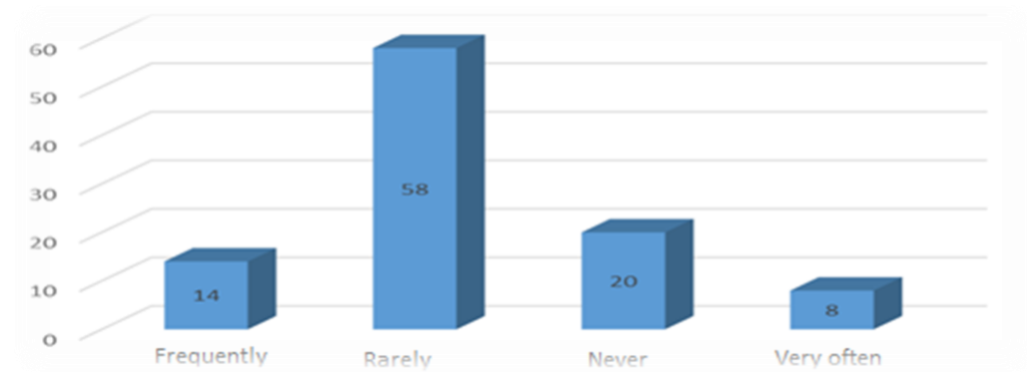

Figure 2. Frequency of purchasing refurbished products
Sources: developed by the authors.

Research reveals that the vast majority of consumers rarely purchase refurbished products.
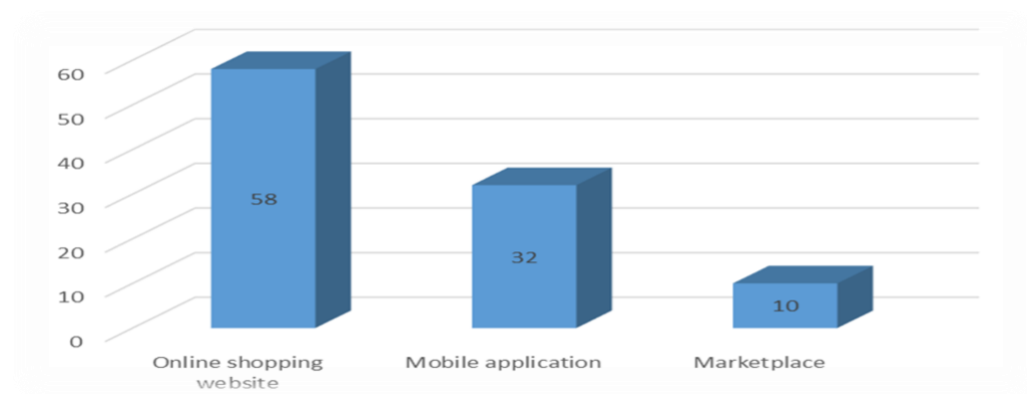

Figure 3. Refurbished product shopping places
Sources: developed by the authors.

Participants primarily prefer online shopping platforms for purchasing refurbished products, followed by mobile applications and marketplaces.
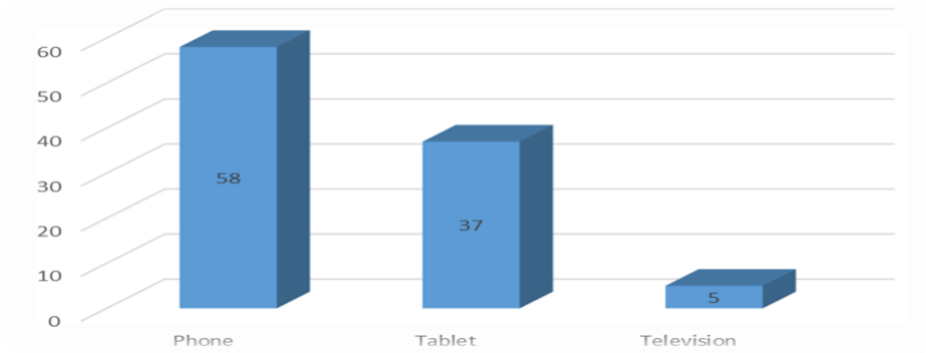
Figure 4. Refurbished Product Preferences
Sources: developed by the authors.

When the preferences among the participants are examined, the highest demand among refurbished products is met by phones. These are followed by tablets and televisions.
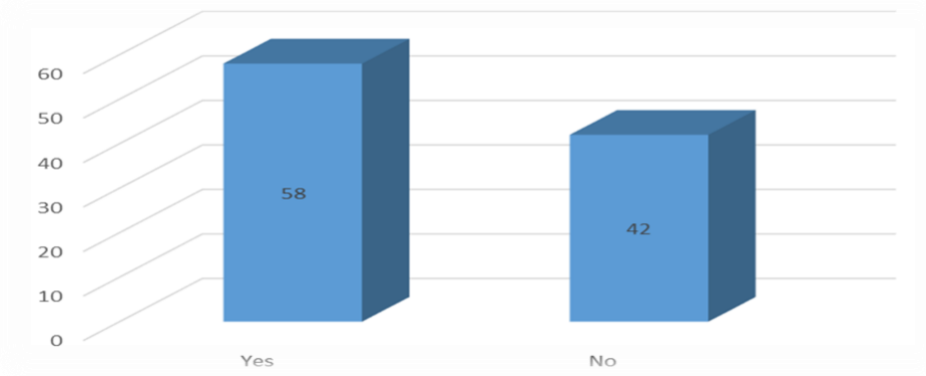

Figure 5. Recommendation of the refurbished product to his immediate circle
Sources: developed by the authors.

In refurbished product purchases, 58% of the participants evaluated their shopping experience positively and recommended these products to their close friends. This finding indicates that refurbished products create overall satisfaction and a positive reputation among customers.
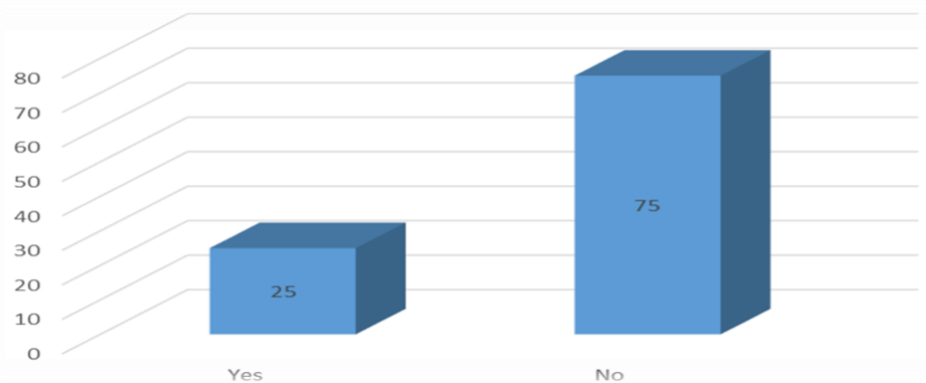

Figure 6. Problems experienced in the exchange of refurbished products
Sources: developed by the authors.

While 75% of the participants state that they have not experienced any problems in their purchase of refurbished products, the rate of those who state that they have a problem is 25%. In Table 2, the Cronbach's α reliability coefficients for the subdimensions of the perceptual risk dimensions of the participants in Generation Z were examined.

Table 2. Reliability analysis of the scales included in the research

Scales	Number of variants	Cronbach Alpha
Factor 1- Social Risk	4	0.892
Factor 2- Physical Risk	3	0.949
Factor 3- Perceived Risk	4	0.858
Factor 4- Psychological Risk	3	0.955
Factor 5- Financial Risk	3	0.911
Factor 6- Tim Risk	3	0.891
Factor 7- Performance Risk	3	0.849
Factor 8- Purchase Intention	5	0.875

Sources: developed by the authors.

According to the results obtained, Cronbach's α values were calculated to be 0.892 for Factor 1, 0.949 for Factor 2, 0.858 for Factor 3, 0.955 for Factor 4, 0.911 for Factor 5, 0.891 for Factor 6, and 0.849 for Factor 7. The Cronbach's α value for the definition of the scale of perceptual risk dimensions is 0.836. These findings show that the subdimensions of the scale are good and very reliable in terms of internal consistency. According to the data in Table 3, the eigenvalues of seven factors were found to be greater than 1. The fact that the eigenvalues determined by factor analysis are greater than 1 is an important criterion that is widely used in determining the number of factors to be included in the scale (Buyukozturk, 2002).

Table 3. Dimensions of perceived risk explanatory factor analysis results

	Factors						
	1	2	3	4	5	6	7
Social Risk							
When I purchase a refurbished product, I think I will lose my status and prestige.	0.912						
Buying refurbished products is a sign of poverty	0.858						
When I purchase a refurbished product. I think that I will not be liked by the people around me.	0.801						
My environment does not welcome my purchase of refurbished products.	0.796						
Physical Risk							
I am concerned about whether my health will be adversely affected if I purchase refurbished products.		0.949					
I am concerned that refurbished products are contagious.		0.938					
I am concerned that refurbished products are not clean and hygienic.		0.911					
Perceived Risk							
I worry that refurbished products may not perform as well as new ones.			0.904				
When I purchase refurbished products. I fear that I will spend more time on repairs.			0.866				
I think buying refurbished products is not a good investment.			0.838				
I think that refurbished products will not save resources and energy as advertised.			0.674				
Psychological Risk							
When I purchase a refurbished product. I worry that it carries the negative energy of the previous owner.				0.968			
The thought of buying a refurbished product makes me unnecessarily nervous.				0.956			
The thought of buying a refurbished product makes me feel more uncomfortable than buying a new one.				0.909			
Financial Risk							
I am concerned about additional costs when using a refurbished product.					0.954		
I am concerned that I will not get back what I paid for when I purchase a refurbished product.					0.943		
I think it is bad choice to spend money to purchase refurbished product.					0.821		

Continued Table 3

	1	2	3	4	5	6	7
	**Factors**						

	1	2	3	4	5	6	7
Time Risk							
I think that buying refurbished products means using time inefficiently.						0.903	
When I purchase a refurbished product, I think it will take time to return it.						0.881	
When I purchase a refurbished product, I think it will take a lot of time to fix the mistakes I will encounter.						0.832	
Performance Risk							
I worry that refurbished items will turn out to be of poorer quality than I expected							0.882
When I purchase a refurbished product, I worry that it will turn out differently than I expected.							0.849
When I purchase a refurbished product, there is a risk that a fake will be used/sent instead of the original product.							0.836
Explained Variance	13.376	26.092	38.769	50.860	62.358	73.214	83.627
Total explained variance	83.627						
KMO sample adequacy	0.707						
Bartlett's Sphericity Test Chi-Square value	9262.982						
Sd (Degrees of Freedom)	9262.982						
p value	0.000						

Sources: developed by the authors.

This criterion emphasizes that eigenvalues are related to the structural integrity of the scale and the fit of the factors. During the factor analysis process, first, the Kaiser–Meyer–Olkin (KMO) value was calculated, and Bartlett's sphericity test was examined. According to the result of the Kaiser–Meyer–Olkin (KMO) test, a calculated value less than 0.50 indicates that it is not appropriate to continue the factor analysis (Cokluk et al., 2012). This finding is accepted as an important criterion in terms of evaluating the structural integrity of the analysis and the relationship between the factors. In this study, the KMO value is greater than 0.50. The total explained variance is 83,627%. According to the results of the factor analysis, it was determined that the expressions were grouped under 7 different factors in total after the rotation process, and the factor load values of the items under these factors varied between 0.674 and 0.968.

Table 4. Intention to Purchase Scale Factor Analysis Results

Factor	Statements	Factor Loads	Explanatorıness of Factor(%)
Factor 1	I will probably purchase a refurbished product in the near future.	0.942	70.476
	I will encourage my relatives and friends to buy a refurbished product.	0.404	
	When I have to choose between two new and refurbished products, I will normally choose the refurbished product.	0.969	
	If I shop for electronic products, I can browse refurbished products.	0.965	
	I am more likely to buy refurbished products.	0.777	
KMO sample qualıfıcatıon,		0.817	
Bartlett's Globalıty Test Chı-Square Value		2360.127	
Sd (Degree of Freedom)		10	
p value		0.000	

Sources: developed by the authors.

When Table 4 is examined, it is determined that the Kaiser–Meyer–Olkin (KMO) value of the scale is 0.817, which indicates that the scale is at a good level. On the other hand, as a result of the analysis made for 5 items in the subdimension of the scale according to Table 4, the variance value was calculated to be 70,476%. The factor loadings of the items in the scale should be 0.30 and above (Secer, 2013). In the study, the factor loadings of the scale ranged from 0.404 to 0.969. Therefore, no statement was removed from the scale. According to the analysis results in Table 5, a high, positive and statistically significant relationship was observed between purchase intention and the psychological risk subdimension (r=0.867, p<0.001).

Table 5. Correlation Analysis

	Skewness.	Kurtosis.	1	2	3	4	5	6	7	8
1. Social risk	0.853	0.036	1							
2. Performance risk			-0.090	1						
3. Perceived risk			0.008	-0.037	1					
4. Psychological risk			0.296**	0.036	0.047	1				
5. Financial risk			-0.051	0.080	0.292**	0.036	1			
6. Time risk			0.428**	0.009	-0.222**	0.090	-0.073*	1		
7. Physical risk			-0.014	0.371**	0.103*	-0.030	0.166**	0.001	1	
8. Purchase intention risk	0.132	-0.791	0.444**	-0.065	0.046	0.867**	0.045	0.214**	0.092	1

Sources: developed by the authors.

A low, positive and statistically significant relationship was found between purchase intention and the social risk subdimension (r=0.444, p<0.01). Similarly, a low, positive and statistically significant relationship was found between purchase intention and the time risk subdimension (r=0.214, p<0.01). Considering the skewness and kurtosis values in Table 5, it was determined that the data were close to the normal distribution. As shown in Table 6, multiple regression analysis was used to measure the effect of independent variables on the dependent variable. The explanatory power of the model was evaluated using the coefficient of determination (R^2). According to the analysis results, the coefficient of determination was found to be 0.803. This result shows that the independent variables explain 80.3% of the total variance.

Table 6. Regression Analysis on the Effect of Perceived Risk Dimensions on Intention to Purchase

Independent Variables	No standardized Coefficients		Standardized Coefficients	t	P
	B	S. Error	β		
Constant	0.825	0.187		4.399	0.000
F1	0.148	0.023	0.167	6.480	0.000
F2	-0.110	0.041	-0.065	-2.707	0.007
F3	0.015	0.024	0.015	0.630	0.529
F4	0.715	0.020	0.809	34.920	0.000
F5	0.032	0.019	0.038	1.646	0.100
F6	0.067	0.022	0.077	3.045	0.002
F7	-0.080	0.040	-0.049	-2.018	0.044
R^2	0.803				

Sources: developed by the authors.

Looking at the table containing the results of multiple regression analysis, it was determined that social risk, one of the perceived risk subdimensions, has a low positive and significant effect on the effect of perceived risk dimensions of people in Generation Z on the purchase intention of the refurbished product, performance risk has a low negative significant effect, psychological risk has a good positive significant effect, time risk has a low positive significant effect, and physical risk has a low negative significant effect. Table 7 shows the acceptance/rejection status of the research hypotheses. When the table is examined, it is seen that 5 out of 6 hypotheses were accepted.

Table 7. Acceptance/Rejection of Research Hypotheses

Hypothesis	Acceptance/Rejection
H1: Perceived financial risk in refurbished product purchases has a significant effect on consumers' purchase intentions.	**Rejection**
H2: Perceived physical risk in refurbished product purchases has a significant effect on consumers' purchase intentions.	**Acceptance**
H3: Perceived psychological risk in refurbished product purchases has a significant effect on consumers' purchase intentions.	**Acceptance**
H4: Perceived performance risk in refurbished product purchases has a significant effect on consumers' purchase intentions.	**Acceptance**
H5: Perceived social risk in refurbished product purchases has a significant effect on consumers' purchase intentions.	**Acceptance**
H6: Perceived time risk in refurbished product purchases has a significant effect on consumers' purchase intentions.	**Acceptance**

Sources: developed by the authors.

5. Conclusions. As a result of the literature research, it is revealed that consumers prefer refurbished products because of environmental benefits, economic advantages, brand image and similar reasons. In this context, brands and companies that want to increase their market share in the refurbished product market need to determine which factors have a greater impact on consumer preferences and to construct marketing communication studies in this direction. As a result of this research conducted in this context, it was found that social risk has a low positive and significant effect on the effect of perceived risk dimensions of Generation Z consumers on the purchase intention of the refurbished product, performance risk has a low negative significant effect, and psychological risk has a good positive significant effect. It was determined that time risk has a low positive and significant effect, and physical risk has a low negative significant effect. These results reveal that it is much more important for consumers to be personally satisfied with the refurbished products they purchase. In addition, it can be said that the opinions and thoughts of the people around an area are also effective in the choice of refurbished products. The fact that the financial risk is insignificant in the research can be interpreted to be the fact that the current new phone prices are very high and that Generation Z consumers, who have not yet fully earned their own income, will not be able to purchase these new phones.

In the research, it was determined that the perceived performance risk has a low negative effect on the preference of purchasing refurbished products. In another study, it was similarly found that performance risk negatively affects the preference for refurbished products Cudok et al. (2022). Again, in similar studies on the subject, it was determined that the perceived performance risk of refurbished products adversely affects the purchasing decisions of consumers since refurbished products are more likely to deteriorate more easily and harm users (Hamzaoui & Linton 2010; Mugge et al., 2017).

For this reason, companies should be more sensitive to performance risk and pay more attention to eliminating the performance risks that consumers may face. Considering the literature research and research findings, it is understood that consumers may tend to purchase refurbished products due to their sensitivity to the environment. However, it should be noted that economic difficulties are also an important motivation for consumers to purchase refurbished products. Therefore, it would not be wrong to say that increasing the benefits and equipment performance of the refurbished products of the companies operating in the sector can positively affect the purchase of refurbished products by young and middle-aged consumers and that the increase in risk factors will tend to lower the consumers' priority of purchasing refurbished products. It would be wise for companies to create a strategy to take advantage of this growing market. Firms should emphasize that it is much more economical to buy refurbished products rather than new products during periods of high inflation. In addition, it should be stated that the environment is less damaged due to refurbished products, and for consumers with environmental concerns, purchasing refurbished products is a more beneficial consumption act for nature and the environment. For example, in line with the results of this and similar studies, they can prepare marketing communication campaigns that take into account the highest priority risks among the risk perceptions of consumers. For example, celebrities, social media influencers, etc., who use refurbished products in terms of social risk can campaign together. They can conduct public performance tests comparing new and refurbished products in terms of performance risk and post them on free social media platforms. They can carry out marketing communication activities that highlight the contribution of refurbished products to the environment and their advantages over new products in terms of price and performance and increase the environmental awareness of consumers. They can create a free channel to answer questions from consumers purchasing refurbished products. They can also create a platform where consumers who buy refurbished products will share their experiences. Seeing the positive experiences of purchasing consumers will undoubtedly contribute to the change of minds of many consumers who stay away from such products. In addition, for refurbished products, companies' implementation of best practices in their marketing programs will improve the results of their studies and contribute to a positive customer experience in secondary markets. As a result, the better the experience that product manufacturers and retailers provide for refurbished products, the greater the strength of brands and the greater the trust of consumers.

There are some limitations in this study. First, the data are obtained only from the younger consumer segment and therefore it would not be accurate to generalize the findings to other age groups. The focus of the current study is on perceived risk dimensions. Future studies can build on the current study and focus on consumer behavior towards sustainability. Finally, future studies may also focus on gender, country or cross-cultural differences in youth consumer behavior towards these refurbished products.

Author Contributions: conceptualization, developed theoretical background and literature review, N. G.; provided data and prepared methodology, E. O.; performed the analysis and visualization of results, writing review, and editing, N. G. and E. O.

Conflicts of Interest: The authors declare no conflicts of interest.
Data Availability Statement: Not applicable.
Informed Consent Statement: Not applicable.

References
Abbey, J. D., Meloy, M. G., Blackburn, J., & Guide, V. D. R. (2015). Consumer Markets for Remanufactured and Refurbished Products. *California Management Review*, 57(4), 26–42. [Google Scholar] [CrossRef]

Argo, J. J., Dahl, D. W., & Morales, A. C. (2006). Consumer contamination: How consumers react to products touched by others. *Journal of Marketing*, *70*(2), 81-94. [Google Scholar] [CrossRef]

Balbay, S., Sarıhan, A., & Avsar, E. (2021). Circular economy/industrial sustainability approach in the world and in Turkey. *European Journal of Science and Technology*, *27*, 557-569. [Google Scholar]

Bashir, S., Aslam, M. A. N. A. N., Ibrahim, F. A. R. I. D. A. H., & Kaur, K. (2017). Consumer's perceived communicational risks in predicting internet-based shopping intention. *Jurnal Komunikasi-Malaysian Journal of Communication*, *33*(1). [Google Scholar]

Baxter, W., Aurisicchio, M., Mugge, R., & Childs, P. (2017). Positive and negative contamination in user interactions. In *DS 87-8 Proceedings of the 21st International Conference on Engineering Design (ICED 17) Vol 8: Human Behaviour in Design, Vancouver, Canada, 21-25.08.2017* (pp. 509-518). [Google Scholar]

Blomsma, F., & Tennant, M. (2020). Circular economy: Preserving materials or products? Introducing the Resource States framework. *Resources, Conservation and Recycling*, *156*, 104698. [Google Scholar] [CrossRef]

Buyukozturk, S. (2002). *Sosyal bilimler için veri analizi el kitabı* (2. Baskı) Ankara: Pegem-A Yayıncılık. [Google Scholar]

Çakar, U., & Polat, C. A. N. (2019). Risk boyutlarının genel algılanan risk uzerine etkisi: e-ticaret sitelerine yonelik bir arastırma. *Ataturk İletisim Dergisi*, (17), 39-68. [Google Scholar] [CrossRef]

Çakır, İ., & Dedeoglu, A. O. (2020), İkinci El Giysi Satın Alımında Algılanan Risklerin Satın Alma Niyeti Uzerine Etkisi. *Uluslararası İktisadi ve İdari İncelemeler Dergisi*, (27), 55-72. [Google Scholar] [CrossRef]

Çokluk, O., Sekercioglu, G., & Buyukozturk, S. (2012). *Sosyal bilimler için çok degiskenli istatistik: SPSS ve LISREL uygulamaları* (Vol. 2). Ankara: Pegem Akademi. [Google Scholar]

Cudok, A., Neugebauer, L., & Vietor, T. (2022). Increasing Acceptance for Refurbished Products at the Example of E-Cargo Bikes. *Procedia CIRP*, *105*, 571-576. [Google Scholar] [CrossRef]

Ecevit, M. Z., & Duman, O. (2022). Tuketicilerin yenilenmis urun satın alma niyetine etki eden faktorlerin incelenmesi. *Business & Management Studies: An International Journal*, *10*(3), 997-1010. [Google Scholar]

Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. *International journal of human-computer studies*, *59*(4), 451-474. [Google Scholar] [CrossRef]

Freyberg, A., Dudok van Heel, O., Minutella, D., & Chatterji, M. (2022). Why consumers are ready for refurbished. [Link]

Gaur, J., Amini, M., & Rao, A. K. (2017). Closed-loop supply chain configuration for new and reconditioned products: An integrated optimization model. *Omega*, *66*, 212-223. [Google Scholar] [CrossRef]

Gaur, J., Amini, M., Banerjee, P., & Gupta, R. (2015). Drivers of consumer purchase intentions for remanufactured products: A study of Indian consumers relocated to the USA. *Qualitative Market Research: An International Journal*, *18*(1), 30-47. [Google Scholar] [CrossRef]

Gaur, J., Srivastava, A., & Gupta, R. (2022). Willingness to purchase refurbished products sold online: a qualitative inquiry of young consumers from an emerging market. *Young Consumers*, *23*(4), 627-650. [Google Scholar] [CrossRef]

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference 11.0 update* (4th ed.). Boston: Allyn & Bacon.

Goh, E., & Lee, C. (2018). A workforce to be reckoned with: The emerging pivotal Generation Z hospitality workforce. *International Journal of Hospitality Management*, *73*, 20-28. [Google Scholar] [CrossRef]

Gumus, N. (2020). Z kusagı tuketicilerin satın alma karar tarzlarının incelenmesi. *Yasar Universitesi E-Dergisi*, *15*(58), 381-396. [Google Scholar] [CrossRef]

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: Global edition*. New Jersey, Pearson Prentice Hall.

Halim, S., Gan, S.-S., & Oentoro, J. M. (2022). Identifying factors that influence customers' interest in buying refurbished smartphones: An Indonesian context. *Asia-Pacific Journal of Science and Technology,* 27(04), 27. [Google Scholar] [CrossRef]

Hamzaoui Essoussi, L., & Linton, J. D. (2010). New or recycled products: how much are consumers willing to pay?. *Journal of Consumer Marketing*, 27(5), 458-468. [Google Scholar] [CrossRef]

Hassan, A. M., Kunz, M. B., Pearson, A. W., & Mohamed, F. A. (2006). Conceptualization and measurement of perceived risk in online shopping. *Marketing Management Journal*, 16(1), 138-147. [Google Scholar]

Hazelwood, D. A., & Pecht, M. G. (2021). Life extension of electronic products: a case study of smartphones. *IEEE Access*, 9, 144726-144739. [Google Scholar] [CrossRef]

Horton, R. L. (1976). The structure of perceived risk: Some further progress. *Journal of the Academy of Marketing Science*, 4, 694-706. [Google Scholar] [CrossRef]

King, A. M., & Burgess, S. C. (2005). The development of a remanufacturing platform design: a strategic response to the directive on waste electrical and electronic equipment. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 219(8), 623-631. [Google Scholar] [CrossRef]

Mahmoodi, H., & Heydari, J. (2021). Consumers' preferences in purchasing recycled/refurbished products: an empirical investigation. *International Journal of Services and Operations Management*, 38(4), 594-609. [Google Scholar] [CrossRef]

Michaud, C., & Llerena, D. (2011). Green consumer behaviour: an experimental analysis of willingness to pay for remanufactured products. *Business strategy and the Environment*, 20(6), 408-420. [Google Scholar] [CrossRef]

Mugge, R., Jockin, B., & Bocken, N. (2017). How to sell refurbished smartphones? An investigation of different customer groups and appropriate incentives. *Journal of Cleaner Production*, 147, 284-296. [Google Scholar] [CrossRef]

Odabası, Y., & Barış, G. (2011). *Tuketici Davranışı*. MediaCat Yayınları: İstanbul.

Onurlubas, E. & Gumus, N. (2022). Algılanan Risk Boyutlarının İkinci El Kıyafet Satın Alma Niyetine Etkisi: Z Kusagı Uzerine Bir Arastırma. *Tekstil ve Muhendis*, 29 (126), 106-114. [Google Scholar]

Pathak, V. K., & Pathak, A. (2017). Understanding perceived risk: A case study of green electronic consumer products. *Management Insight*, 13(1), 33-37. [Google Scholar]]

Pigosso, D. C. A., Zanette, E. T., Filho, A. G., & Ometto, A. R. (2013). Ecodesign methods focused on remanufacturing. *Journal of Cleaner Production*, 18(1), 21-31. [Google Scholar] [CrossRef]

Rahbar, E., & Wahid, N. A. (2011). Investigation of green marketing tools' effect on consumers' purchase behavior. *Business strategy series*, 12(2), 73-83. [Google Scholar] [CrossRef]

Seçer, İ. (2013). *SPSS ve LISREL ile Pratik Veri Analizi ve Raporlastırma*. Ankara: Anı Yayıncılık.

Tanrıkulu, E., & Bakır, N. O. (2021), Tuketicilerin Çevrimiçi Alısveristeki Faydacı Ve Hedonik Alısveris Degerinin Algılanan Fayda Ve Risk Uzerindeki Etkisi: Trendyol Ve Zara Tuketicileri Uzerine Bir Arastırma. *Oneri Dergisi*, 16(56), 634-667. [Google Scholar] [CrossRef]

Transparency Market Research Inc. (2022). Refurbished Electronics Market to Gain Value of $ 272.91 Billion by 2031, TMR Study. [Link]

Van Weelden, E., Mugge, R., & Bakker, C. (2016). Paving the way towards circular consumption: exploring consumer acceptance of refurbished mobile phones in the Dutch market. *Journal of Cleaner Production*, 113, 743-754. [Google Scholar] [CrossRef]

Vorasayan, J., & Ryan, S. M. (2006). Optimal price and quantity of refurbished products. *Production and Operations Management*, 15(3), 369-383. [Google Scholar] [CrossRef]

Wahjudi, D., Gan, S. S., Anggono, J., & Tanoto, Y. Y. (2018). Factors affectıng purchase ıntentıon of remanufactured short lıfe-cycle products. *International Journal of Business and Society*, 19(2), 415-428. [Google Scholar]

Wallner, T. S., Magnier, L., & Mugge, R. (2020). An exploration of the value of timeless design styles for the consumer acceptance of refurbished products. *Sustainability*, 12(3), 1213. [Google Scholar] [CrossRef]

Wang, S., Wang, J., Yang, F., Wang, Y., & Li, J. (2018). Consumer familiarity, ambiguity tolerance, and purchase behavior toward remanufactured products: The implications for remanufacturers. *Business Strategy and the Environment*, 27(8), 1741-1750. [Google Scholar] [CrossRef]

Yuce, A. (2014). Perakendecilik sektorunde tuketicilerin algıladıkları riskler: supermarketlerde bir uygulama. *Ekev Akademi Dergisi*, (58), 229-250. [Google Scholar]

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Дослідження впливу сприйняття ризику споживачами покоління Z на їх інтенцію купувати відремонтовані товари

Зміни в культурі споживання людей, економічні труднощі, які вони переживають, та зростання екологічної свідомості призводять до значного збільшення продажів відремонтованих товарів, особливо технологічних пристроїв. Зростання ринку відремонтованих товарів не лише дозволяє споживачам отримувати їх за більш низькими цінами, але також зменшує витрати підприємств на виробництво і, з екологічної точки зору, мінімізує можливі відходи та збитки, що виникають під час виробництва нових товарів. У майбутньому очікується поступовий ріст продажів відновлених товарів та розширення цього ринку товарів завдяки його подальшій диверсифікації. Основною метою цього дослідження є вивчення впливу рівня ризику, який споживачі відчувають, на їхнє бажання купувати відновлені товари. Об'єктом дослідження обрано споживачів відремонтованих товарів, які проживають у Туреччині і належать до покоління Z. Ця категорія споживачів є важливою частиною суспільства Туреччини і визначає технологічні тенденції країни. Дослідження проводилося в період із січня по березень 2022 року за участю 415 учасників, які проживають у Стамбулі, найбільшому місті Туреччини, визначених методом зручної вибірки. У статті для перевірки гіпотез використовувався методичний інструментарій регресійного аналізу. Емпіричні результати дослідження засвідчили, що соціальний ризик має слабкий позитивний і значущий вплив на наміри придбання відремонтованих товарів. Ризик продуктивності має слабкий негативний і значущий вплив, психологічний ризик має позитивний і значущий вплив, ризик часу має слабкий позитивний значущий вплив, а фізичний ризик має слабкий негативний і значущий вплив. Емпіричні результати дослідження свідчать, що психологічне сприйняття ризику для споживачів покоління Z є важливим фактором у формуванні їхніх вподобань стосовно придбання відремонтованих товарів.

Ключові слова: Туреччина; відремонтований товар; сприйняття ризику; технологія.