

DOI: <http://doi.org/10.5281/zenodo.7988922>

Accepted: 28.05.2023

Knowledge as a Public Good: A Research on Knowledge Sharing Of the Public Finance Scientists*

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Abstract

Knowledge, thereby knowledge sharing is in tendency to increase by years across world. Especially, it can be said that due to spread over of the internet, reaching knowledge has become much easier compared to early 2000s. The fact that knowledge easily spread among individuals as it spreads in public has led to that it has been mentioned in debates about publicity in public finance literature. In this research, sharing level of knowledge having some features of public goods was assessed by requesting knowledge from scientists of public finance. In this regard, knowledge has been requested from 270 public finance academicians by e-mail and the results obtained have been evaluated according to instructor's titles and scoring criteria. In the end of this research, knowledge sharing rate of the public finance scientists has been found 40 percent. In addition, it is seen that among teaching personnel, teaching assistants are the most willing and having the highest score to share knowledge while professors are least willing to share knowledge and having the lowest score. Following teaching assistants, the group most willing to share knowledge turns out to be research assistants, associate professors, assistant professors respectively.

Keywords: Public Goods, Knowledge, Knowledge Sharing, Scientists.

JEL Classification: H39, H40, H41.

* This study was presented in 35th International Public Finance Conference which was held between 14th and 17th of October 2021 in Antalya/Turkey.

1. Introduction

Today, knowledge has the opportunity to spread rapidly through various channels such as smart phones, e-mails, etc., notably over the internet. On the other hand, access to knowledge has become easier along with the 2000s compared to previous years. The dissemination of knowledge through various channels leads to debates about whether knowledge is a public good or not. In the literature, there is no consensus on whether knowledge is a public or private good.

The fact that access to knowledge has become easier over the years has brought along more sharing of knowledge. With the aim of educating people, university professors educate students and contribute to the development of human capital in the society. Knowledge sharing should be encouraged in the fields of teaching and education (Zhang, et al., 2026, p. 1267). In addition to this situation, knowledge sharing is frequently done among scientists in the production of new scientific activities in the academic community. It is vital to examine the knowledge sharing requests of academicians in the academy, where knowledge is widely used. In addition, there is a fact that more people share the knowledge, the better academicians' scientific performance will be (Alyouzbaky et al., 2022). In spite of the importance of sharing knowledge it would be said that academicians still hoard the knowledge (Goh & Sandhu, 2023, p. 38). Accordingly, the main objective of the research is evaluation of knowledge sharing of public finance scientists. As the literature about knowledge sharing started to expand in 2000s, national literature could not follow the trend. With the study, knowledge sharing researches in Turkey could draw more attention.

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In the research, the knowledge sharing of public finance scientists was analyzed by requesting knowledge about their current work or a general subject related to the academy via e-mail. In addition to the interpretation of the obtained data, it was graded and classified according to the titles of public finance scientists.

Evaluating the people's knowledge sharing by e-mail is one of the methods used in the literature (Carley & Wendt, 1991; Velmurugan et al., 2010; Hwang, 2012; Majid & Chitra, 2013). As email become a vital media source to distribute knowledge in different organizations, more people ask information from this platform (Laclavik et al., 2007, p. 1079). Also via email status differences between people are diminished (Sproull & Kiesler, 1986).

2. Conceptual Framework

In this part of the research, the concept of knowledge and public goods, which are frequently discussed in the literature, is analyzed. Discussions about the concept of public goods, definitions, and the characteristics of public goods as well as the classification of public goods are mentioned. The chapter ends with different definitions of knowledge and knowledge sharing.

2.1. Public Good Concept

Discussions about the concept of public good and the publicity of a good date back to 1739, when David Hume's discussion on the "joint good" (Sagasti & Bezanson, 2001, p. 7). Hume explains his thoughts on public goods in his Treatise of Human Nature published in 1739:

“Based on the example of a canal project involving two neighbors and going through their land, two neighbors have come to an agreement about a canal that will run through their own land. However, even one person giving up on the agreement or failing to fulfil his responsibilities may cause the entire channel project not to be implemented. Considering a situation involving thousand people, it is certainly not possible for everyone to reach a consensus. This is how political institutions can easily solve such problems by getting involved.” (Cornes & Sandler, 1996, p. 3).

After David Hume, classical economists such as Adam Smith, David Ricardo and Malthus drew attention to the need for common goods that provide public benefits. Adam Smith put forward a list of public goods that should be provided by the government, explaining that in addition to defense and education there are various public works such as roads, bridges, canals (Sagasti & Bezanson, 2001, p. 5). In the article written by Samuelson (1954) is crucial for mentioning the pure public goods. Samuelson introduced non-excludability and non-rivalry as the fundamental features of pure public good. In sum, it is possible to divide public goods into three main characters. Firstly, public goods generate significant externalities. Secondly, there is no rivalry in the consumption of public goods, albeit to a certain extent, and individuals cannot be excluded from their consumption. Thirdly, public goods embody joint actions that increase social welfare. In addition to this situation, political decision makers decide which public goods will be produced and which cannot be produced according to the social and cultural preferences of individuals (Sagasti & Bezanson, 2001, p. 5-7). For example, a ship passing by the lighthouse cannot be excluded from its usefulness, and in the mentioned example, the lighthouse is a public good. If it is possible to be excluded it is possible to be deprived of the benefits of public good since a fee will be paid (Stiglitz, 2000, p. 128). Fireworks shows and street lamps, where it is very difficult to exclude individuals, can be shown as an another example of public goods (Cornes & Sandler, 1996, p. 9).

There is no consensus in the literature on definition of public goods. While some economists take into account the properties of goods when defining public goods, some focus on the social and cultural characteristics of nations. Malkin and Wildavsky (1991) argue that the distinction between private goods and public goods are not subject to a certain criterion, and a good that is private for one nation may be public good for another nation. Public goods are defined as continuous and regular services provided to the society by the state or public legal entities, in order to meet the general and common needs of individuals, for the public benefit (Yumuşak & Aydın, 2005, p. 110-111). According to Kaul and Mendoza (2003), public goods are goods in which there is no rivalry in consumption, it is not likely to exclude from the benefit of individuals, cannot be priced

effectively in the market, and when priced, the market fails.

Table 1: Classification of Public Goods

		Pure Public Goods	Impure Public Goods	Club Goods	Common Goods
INTRAGENERATIONAL	Regional	Preventing Forest Fires	Waterways	Electric Grid	Medical Aid
		Animal Disease Control	Highways	Knowledge Networks	Technical Assistance
	Global	Weather Forecasts	Satellite Transmissions	Canals	Foreign Aid
		World Court	Disease Control	Internet	Drug Interdiction
INTERGENERATIONAL	Regional	Wetland Protection	Fisheries Protection	National Parks	Peacekeeping
		Toxic Waste Cleanup	Hunting Protection	Lakes	Cultural Norms
	Global	Ozone Shield Protection	Ocean Fisheries Antarctica Protection	Transnational Orbits	Tropical Forest Preservation
		Knowledge Creation		Transnational Parks	United Nations

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Resource: Sandler, (1999), Intergenerational Public Goods: Strategies, Efficiency and Institutions, p. 24-25.

The classification of public goods is shown in Table 1. In Table 1, public goods are divided into pure public goods, impure goods, club goods and joint goods. In addition, public goods are classified as intragenerational and intergenerational, global and regional. Pure public goods can be regional, such as prevention of forest fires, cleaning of lakes, or they can have a global nature, such as cleaning of the oceans and prevention of global warming. Impure goods are exemplified as waterways and satellite systems. In Table 1, in the classification of public goods, electricity, knowledge network and internet are in the category of club properties, while medical assistance and disaster relief are in the category of common goods.

Todd Sandler (1999) includes explanations about the publicity of knowledge in his classification of public goods. In the classification in Table 1, explanations regarding the formation and use of knowledge are shown. The subject of the research is the creation of knowledge, satellite knowledge systems, knowledge network and the internet, which is one of the important sources of knowledge today. According to Sandler, creation of knowledge is in the category of intergenerational, global and pure public good; while satellite knowledge systems are in the category of global and impure good for generations. Knowledge network and internet differ in terms of being regional and global as club good.

2.2. Knowledge Concept and Knowledge Sharing

What is meant by knowledge is to change a person's perception or behavior on a subject. Information means to shape, to form as a word root. In other words, what is meant by knowledge is to shape a person and change his or her perspective or understanding on a subject. The person who will decide that the message received with the knowledge is not real knowledge is the person himself/herself receiving the knowledge. Knowledge that is perceived as idle, meaningless by one person may be called real knowledge by another (Davenport & Prusak, 1998, p. 3-4). This situation creates the perception that knowledge is relative. According to another definition, knowledge is a means of understanding, comprehending, learning, and communicating with others (Wilson, 2002, p. 3).

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Another concept to be encountered by talking about knowledge is data. Data is turned into knowledge by adding value to it. The process of transforming data into knowledge is carried out by five different methods. These methods can be listed as follows (Davenport & Prusak, 1998, p. 4):

- Contextualizing the data: Understanding for what purpose the data was collected.
- Categorizing the data: Understanding the important components of data.
- Calculating data: Understanding whether the data is mathematical or statistical.
- Correcting the data: Correcting the errors and inaccuracies in the data.
- Condensing the data: Making the data more brief and concise.

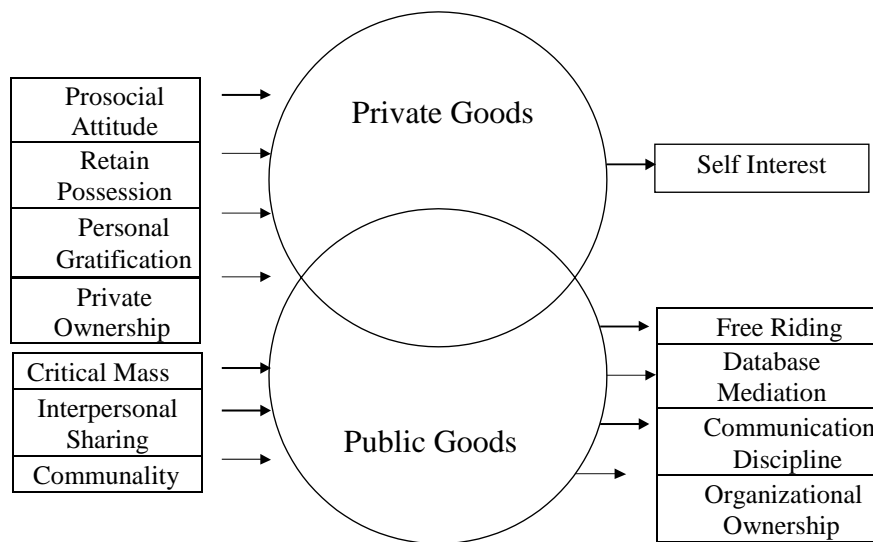
The coding process of the data processed with the help of concepts is done in two ways. In the first stage, which is the knowledge stage, a meta-language determination is made regarding the distributions and various properties of the coded data. In the second stage, the knowledge stage, through the relationships between epistemological elements, knowledge gives people the opportunity to predict the consequences of their actions. Thus, people have the opportunity to plan their actions by controlling their relationship with their environment (Tekeli, 2002, p. 4).

In addition to the definition of knowledge, it is vital to know what knowledge sharing is in terms

of understanding knowledge. In its simplest form, knowledge sharing is providing a helpful response to the requested knowledge. It can be said that knowledge sharing is not usually done through the market mechanism, that is, a certain amount of money is not paid to obtain knowledge, so it is closer to being called a public good (Rafeli & Raban, 2005, p. 65).

Knowledge sharing is frequently studied between different disciplines in the literature. The general conclusion reached in the studies is that knowledge sharing using computer technologies and the internet is a social and behavioral issue (Raban & Rafeli, 2007, p. 2368). It can be said that along with 2000s, knowledge sharing online and interpersonal communication accelerated. In addition to being cheap and fast, sharing knowledge online has an important advantage that it is document-based. The increase in the opportunity to capture knowledge thanks to the online documentation process and the development of knowledge systems draw attention as a factor that increases learning in individuals (Rafeli & Raban, 2005, p. 63).

Figure 1: Knowledge Sharing as Private and Public Goods
Increases Knowledge Sharing **Decreases Knowledge Sharing**



Resource: Raban and Rafeli, (2007), Investigating Ownership and the Willingness to Share Knowledge Online, p. 2372

Figure 1 shows Raban and Rafeli's factors (2007) that decrease and increase knowledge sharing. When Figure 1 is examined, it is seen that private ownership of knowledge increases its sharing compared to public ownership. In the case that knowledge is classified as a private good, the pro-

social attitude of individuals and their desire to maintain their ownership, personal tastes and private good increase knowledge sharing while personal interests decrease knowledge. Where knowledge is a public good, its belonging to the mass, having interpersonal sharing and belonging to a community increase knowledge sharing while free riding, database mediation, communication discipline and organizational ownership decrease knowledge sharing.

2.3. Knowledge as a Public Good

The publicity of knowledge in domestic and foreign literature has become a controversial issue over the years. In some studies, it has been argued that knowledge is a public good because it is not possible to be excluded and there is no rivalry in its consumption while in some studies it is argued that exclusion is possible due to the fact that knowledge is obtained with money and that knowledge is a private good. In this part of the research, some features of public goods and the publicity of knowledge are mentioned.

Knowing the general characteristics of public goods is important in terms of making the distinction between public and private properties. The characteristics of public goods can be listed as the organizing of provision by political demand, the absence of rivalry in consumption, the inability to be excluded from the benefit, the common consumption of goods, the externality, the free-rider problem, the compulsory demand, the natural monopoly. (Yumuşak & Aydın, 2005, p. 111-114).

Table 2: Evaluation of Knowledge in terms of Public Goods Criteria

Properties of Public Goods	Knowledge				
	1	2	3	4	5
	Private Good			Public Good	
1- Organizing of Provision Made by Political Demand			*		
2- Non-rivalry in Consumption					*
3- Non-exclusion from the Benefit		*			
4- Private and Common Consumption			*		
5- External Economies					*
6- Free Rider Problem		*			
7-Compulsory Demand		*			
8- Natural Monopoly				*	

Resource: Yumuşak and Aydın, (2005), Bilgi Kamusal Bir Mal Mıdır?, p.119

In Table 2, the evaluation of the knowledge in terms of public goods criteria includes 1 private good and 5 pure public goods. When knowledge is evaluated in terms of the characteristics of

public goods, it is seen that the knowledge has pure public goods criteria in terms of non-rivalry in consumption and spreading externality. The natural monopoly feature also indicates the public feature of knowledge. Deprivation of benefit, the free-rider problem and compulsory demand may be bring the knowledge closer to the private good category. In this research, what is meant by the knowledge requested from the public finance scientists is the knowledge that has no rivalry in consumption and has a positive externality.

3. Research on Knowledge Sharing of Public Finance Scientists

3.1. Literature

According to Tekeli (2002), the cost of reusing knowledge is zero. It is possible to include knowledge in the category of public goods since it is not possible to put a price on knowledge and the use of knowledge does not consume it. However, knowledge can be made private good, albeit to a certain extent. In their study on the publicity of knowledge, Yumuşak and Aydın (2005) reached the conclusion that knowledge has the characteristics of pure public goods because it creates positive externalities and there is no rivalry in its consumption while they also reach the conclusion that knowledge use has the characteristics of semi-public goods in terms of affecting others' benefiting from knowledge. Rafaeli and Raban (2005) argue that knowledge cannot be defined as a public good, nor is it a private good. While Raban (2007) defines private goods as properties where exclusion is possible and rivalry exists, books sold in the market and some research reports are given as examples of knowledge being a private good. Being charged for reading some academic articles show that knowledge can also be considered as a private good. Public television broadcasts and online discussion forums that are open to everyone's use can be listed among the examples showing that knowledge is a public good (Raban, 2007, p. 312).

There are various national and international studies in the literature to measure knowledge. Yeniçeri and Demirel (2007) examined the knowledge sharing behaviors of employees in a company operating in the textile sector in Bursa, using a survey method. According to the results of the analysis, an inverse relationship was determined between the education levels of the employees and the working time in the textile sector and the barriers to knowledge sharing. Raban and Rafaeli (2007) analyzed the online knowledge sharing of 173 graduate students in business administration by constructing a computer game and concluded that knowledge sharing is high when it has a special quality and low when it is organizational. Özdemir (2008) examined the effects of social network characteristics and trust dimensions of academicians in the fields of science and social sciences on article creation and concluded that the relationship between social capital and knowledge creation varies according to the branches of science.

Haas and Park (2010) examined the knowledge hiding tendency of 1251 geneticists and life scientists from 100 universities in the United States. As a result of the research, they concluded that the attitudes of their superiors were effective in hiding knowledge of scientists. Bousari and

Hassanzadeh (2012) discussed the factors that affect the knowledge sharing behaviors of scientists and obtained findings related to that culture, reward system and organizational structure are effective in knowledge sharing. Baş and Işık (2014) created a Web Based Communication Environment in their study. The knowledge sharing process of 72 teachers and 13 academicians in this created environment was examined and they concluded that the subjects' participation in sharing was low for both groups. Çetin and Şentürk (2016), in their study examining the attitudes of dermatologists across Turkey towards knowledge sharing, concluded that personal output and response expectations positively affect attitudes towards knowledge sharing and negatively affect the expectations of knowledge loss. Oliveira et al. (2019) found that productive academics are more inclined to share knowledge as a result of the survey method conducted on 620 scientists from different fields in Portugal. Apart from these studies, there are various studies in the literature about knowledge sharing (Yuen & Majid, 2007; Wang & Noe, 2010; Navimipour & Charband, 2016; Sergeeva & Andreeva, 2016; Park & Gabbard, 2018).

There are also some dissertations written on knowledge sharing. In the thesis prepared by Öztürk (2009), the organizational characteristics of knowledge sharing and organizational performance were examined by conducting a field study on 72 companies, and it was concluded that knowledge sharing decreased as the size of the organizations increased. Sarıkaya (2011) conducted a survey on knowledge sharing in Kahramanmaraş Governorship, Provincial Special Administration and Municipality. As a result of the survey study, it was seen that the participants were generally willing to share the knowledge they had or to learn from their colleagues. Some other theses on knowledge sharing can be listed as Delaney (2003), Aswegen (2006), Liu (2009), Ariel (2016), Tufan (2016), Özer (2019), and Uyan (2021).

3.2. Purpose and Methodology of the Research

The importance of access to knowledge with a knowledge which has progressed cumulatively from past years to the present is an undeniable reality. The need for knowledge often arises in daily life from simple knowledge, which is the most basic, to corporate knowledge in different sectors, to confidential military knowledge. It is thought that people who have access to knowledge, have the opportunity to use knowledge and have critical thinking contribute to the development of society. In this context, knowledge sharing of scientists and academics who have the competence to create and use knowledge is in an important position. For this reason, it is aimed to analyze the knowledge sharing of academicians in the research. Due to the availability of a list of scientists, public finance scientists who took part in the 35th International Public Finance Conference/Turkey were included in the study.

Due to the fact that an ordered list is included as a sample, public finance scientists are involved in

the research. While making the analysis, the "List of Public Finance Scientists" in the 35th International Public Finance Conference/Turkey, which was updated in certain periods and was last updated on 04.10.2019 before starting the research, was taken into account. In this context, 329 people from 936 public finance department academicians working in 121 state and foundation universities in the list were selected by stratified sampling method. The data collection and evaluation were made in the year of 2019.

In the research, knowledge was requested from the public finance scientists by asking a question via e-mail about the scientific studies they published. Questions were asked by creating a doctoral student account so that the study would have less prejudice, and knowledge was requested through this account. In order to ask questions to the academicians, individual, different questions were asked about their current work. In some cases, general questions about academic life were asked due to difficulties in asking questions. For example, knowledge about associate professorship criteria was requested. The e-mail that was sent while requesting knowledge was prepared as a template and sent to the academicians simultaneously.

Knowledge sharing was scored between 0 and 100 according to the answer obtained. While scoring, two criteria were taken into account, namely the response to the knowledge request and whether the knowledge was shared or not. The knowledge request was evaluated over 30 days, and the knowledge shared 30 days after the knowledge was requested was not taken into account. The necessary calculations in the analysis of the data were made with the help of Microsoft Office Excel.

Table 3: Scoring Applied in Knowledge Sharing Analysis

Score	Response to the Knowledge Request (Max. 50 points)	Knowledge Shared or Not (Max. 50 points)
50 points	Between 0-2 days	Between 0-2 days
45 points	Between 3-4 days	Between 3-4 days
40 points	Between 5-7 days	Between 5-7 days
30 points	Between 8-14 days	Between 8-14 days
20 points	Between 15-21 days	Between 15-21 days
10 points	Between 22-30 days	Between 22-30 days
0 points	More than 30 days	More than 30 days

In Table 3, there are explanations regarding the scoring prepared in the analysis of the knowledge sharing of public finance scientists. Scoring is evaluated both in terms of response time to knowledge request and of knowledge sharing. The two criteria examined in the research are scored separately since there are cases where the requested knowledge is shared later or not shared, despite

receiving a response to the e-mails sent. To exemplify scoring, if a person selected for the sampling returned to the knowledge request on the ninth day but shared knowledge on the nineteenth day, the person concerned received 30 points in terms of returning to the knowledge request, 20 points in terms of sharing knowledge, and a total of 50 points.

3.3. Sampling and Data Collection

Random sample selection was made in the study. Random sample selection methods are divided into four as simple random sampling, systematic random sampling, stratified random sampling, and cluster type random sampling (Kılıç, 2013, p. 45). Stratified sampling method was used in the study. Stratified sampling is a sampling technique that determines the subgroups existing in the universe and ensures that these subgroups are represented in the same proportions. Stratified sampling method is used in the comparison of subgroups as it offers equal choice to subgroups (Özen & Gül, 2007, p. 45). In this context, public finance scientists were divided into subgroups according to their academic titles.

Table 4: Distribution of the Sample Used in the Analysis of Knowledge Sharing by Titles

Title	Sample Size	Scientists Excluded from the Sample	Scientists in the Sample
Professor Dr.	66	11	55
Assoc. Prof. Dr.	61	4	57
Asst. Prof. Dr.	81	10	71
Teaching Asst.	47	13	34
Research Asst.	74	21	53
Total	329	59	270

Table 4 shows the distribution of the public finance scientists selected by the stratified sampling method according to their academic titles. Some scientists were excluded from the analysis due to reasons such as retirement, changing university, and inability to reach the person when knowledge was requested. Ultimately, 270 public finance scientists took part in the research. The reason why the number of people excluded from the analysis among the research assistants is higher than the other scientists can be listed as the incomplete/insufficient contact knowledge of the people as a result of reasons such as change of the working university and change of their titles.

3.4. Interpretation of Findings

The average response rate to the questions directed to the public finance scientists via e-mail was calculated as 48.5%. Nearly half of the public finance department academicians, from whom knowledge is requested, responded to the knowledge request. The sharing of knowledge requested from financial scientists is given as an average. The point to be noted is that not every feedback received is for the requested knowledge. Although the feedbacks that are not for the requested knowledge are evaluated in the category of feedback, they were included in the analysis as 'knowledge was not shared' since the knowledge was not shared. Another situation encountered when requesting knowledge is that the knowledge is not shared at a later time after a feedback about that the knowledge will be shared. This situation was evaluated as the feedback was made but the knowledge was not shared. In the analysis, it was concluded that 40% of the public finance department academicians shared the requested knowledge.

Chart 1: Average of Returns to Knowledge Requests and Knowledge Sharing of Public finance scientists by Title (%)

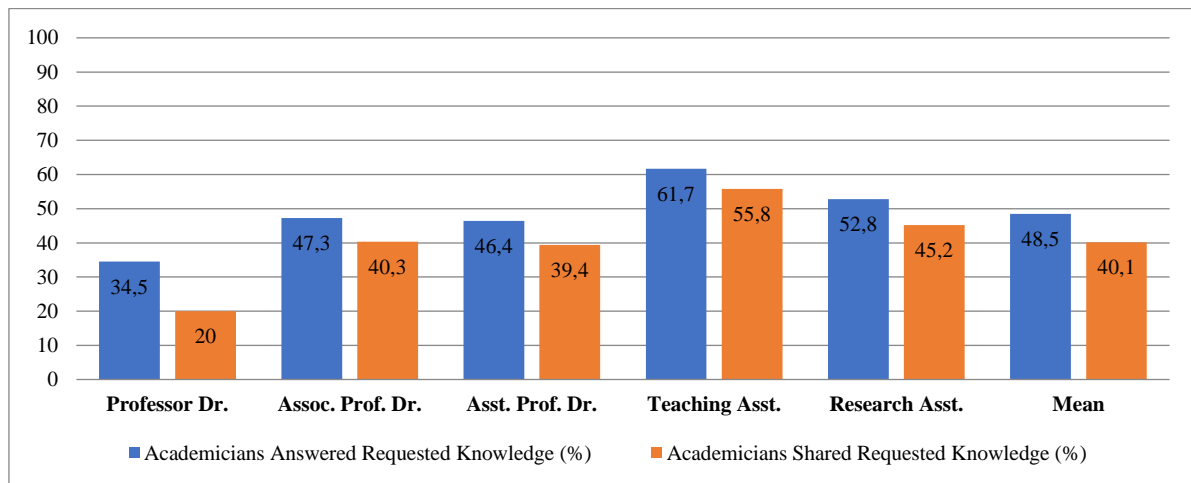


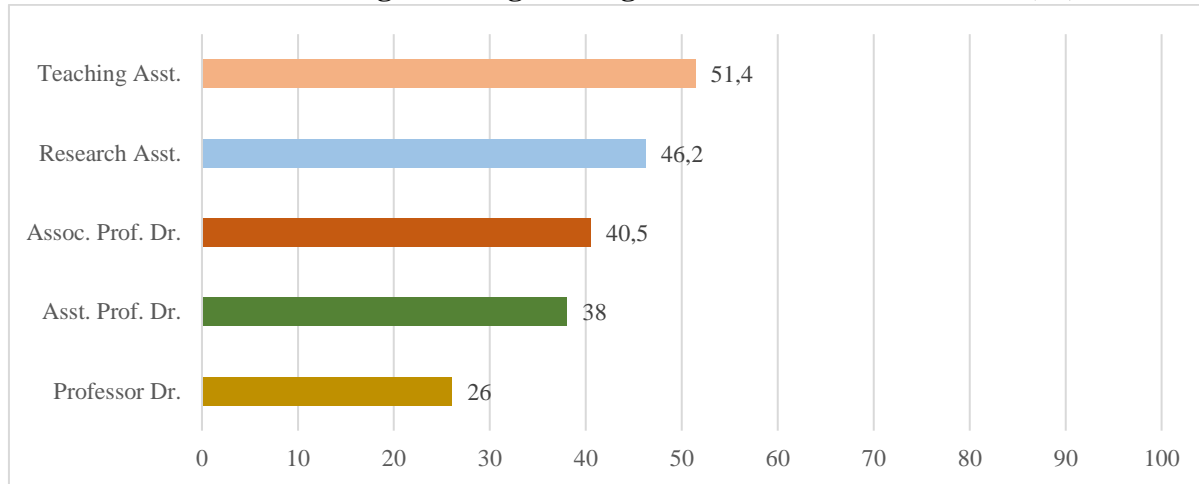
Chart 1 shows the distribution of the public finance scientists who return to the knowledge requested via e-mail and share knowledge according to their titles. In the classification according to titles, teaching assistants had the highest average return rate with 61.7%, while professors had the lowest rate with 34.5%. With 52.8%, research assistants are in the second group with the highest return while academics holding the title of associate professor with 47.3% and assistant professors with 46.4%.

In the other classification made according to titles, the title that shares the most knowledge is teaching assistants, with 55.8%, as is the return average. Teaching assistants are followed by research assistants with 45.2%, associate professors with 40.3% and assistant professors with

39.4%, respectively. It has been concluded that professors are the least willing ones to share the requested knowledge.

In a study evaluates knowledge sharing among academicians, Toksoy and Çetin (2017) found that knowledge sharing changes according to the title. Lecturers' level of knowledge sharing was higher than other academicians (professor, associate professor, assistant professor, research assistant).

Chart 2: Mean of Knowledge Sharing Scoring of Public Finance Scientists (%)



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In Chart 2, the average of the scoring prepared by us in the research is given according to the titles. The highest score is 100 and the lowest score is 0. Two criteria were taken into account while scoring. These criteria are how quickly e-mails are returned for knowledge sharing requests and how quickly the requested knowledge is shared. In line with the results of returning and sharing knowledge, teaching assistants or lecturers have the highest performance in knowledge sharing. The lecturers are followed by research assistants, associate professors, assistant professors and professors, respectively. Professors have the lowest score with 26 points, in line with the overall research. When the applied analysis is evaluated in general, it is concluded that the most willing group to share knowledge is the teaching assistants and the least willing group is the professors.

4. Conclusion and Suggestions

With the 20th century, the possibility of dissemination of knowledge has entered a rapid increasing trend. In this context, the issue of sharing knowledge has also become a subject that is emphasized in both national and international literature. Knowledge sharing has also tended to increase due to the ease of access to knowledge. Depending on the type of knowledge, it can have the characteristics that there is no rivalry in the consumption of public goods and that it cannot be

excluded from its benefit. Scientists, who have an important role in the formation of people who contribute to the development of society, are individuals who have the competence to create and use knowledge. For this reason, it is important to reveal the knowledge sharing requests of the academic community.

Academics are engaged in producing science, revealing new ideas, educating students and sharing knowledge. The starting point of the research is to evaluate the willingness of the scientists of the public finance department to share knowledge in this direction. In this research, knowledge about their current work or general academic issues was requested via e-mail from 270 public finance scientists with the stratified sample selection method. The requested knowledge has been evaluated according to the scoring criteria prepared by us. In the research, it was concluded that 40% of public finance scientists is willing to share knowledge. In addition, it is seen that the group with the most willingness to share knowledge and therefore the highest average score is the teaching assistants while the group with the least willingness to share knowledge and the lowest average score is the professors.

According to the findings obtained as a result of the study, the level of knowledge sharing of scientists is 40%. Trainings, conferences, and panels on the importance of knowledge and knowledge sharing, increasing the number of joint studies in academia and increasing the interaction of knowledge between individuals through the formation of working groups, developing the institutional structure, placing the perception that information should belong to the society rather than the individual, creating a sense of trust between individuals in the academic community, and creating a social environment in order to reduce the trust issues among scientists and creating a reward system that will encourage knowledge sharing, will be able to increase the sharing of knowledge.

Individuals may be less willing to share knowledge via e-mail with people they do not know and do not trust. Minimizing the trust problem may lead to more reliable results from the studies to be carried out by requesting knowledge via e-mail in the future. In addition, another issue that needs to be taken into account in knowledge sharing is to reveal the underlying causes of individuals' knowledge sharing behavior. Since it is beyond the limits of this research, examining the knowledge sharing behaviors of individuals in future research on this subject will contribute to the development of knowledge sharing.

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