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Measuring quality perception of public services: customer-oriented approach

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A B S T R A C T

The focus of this research is on assessing the perception of public service quality through a customer-centred approach. Public service quality comprises multiple factors that are prioritised differently by customers. Therefore, the study aims to conduct a literature review to identify the primary quality dimensions of public services and evaluate the heterogeneity of their perception within the context of Lithuania. The research measures the user perceptions of public service quality. The literature review allowed for identifying service quality indicators and grouping them into dimensions based on unifying characteristics. Such identification of service quality dimensions grounded the research methodology. An adapted SERVQUAL model was used to analyse data collected by a survey to interview customers of Lithuanian public service organisations. Logit and probit models were applied to examine the effect of socio-demographic characteristics and the type of service on customer perceptions of different quality aspects of the provided public services. Explored heterogeneity of attitudes and detailed analysis of socio-demographic factors revealed that women with higher education are the most satisfied users of public services, while less educated men usually have a negative attitude towards the quality of public services. The study confirmed that marital status and income level are not related to customer satisfaction with service quality. Although gender, age, family size, education level, and employment status explain heterogeneity in customer satisfaction, they still account for only a small amount of variance compared to the place of residence and type of service. The study is a significant contribution to the field of service engineering as it introduces a systematic approach to the development of service quality, incorporating models and methods that enable the assessment of service quality and efficiency. The literature review has identified several research gaps related to public service quality, including a lack of research on general public services and areas such as tourism, real estate management, fire protection and rescue.

K E Y   W O R D S
public sector, public sector organisation, public services, service quality, SERVQUAL model, logit model, probit model

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Introduction

In an era characterised by turbulence, uncertainty, geopolitical tensions, and various challenges, such as the pandemic, energy concerns, and high inflation rates, the importance and role of the public sector have become increasingly significant. Consequently, the role of organisations providing public services has become twofold. First, these organisations are required to manage multiple challenges while demonstrating exemplary behaviour in securing the public health, maintaining economic vitality, ensuring national security and defence, and efficiently

navigating all disruptions. Second, they must adequately represent the public interest, promptly respond to changing customer needs and provide quality services.

Indeed, service quality in the public sector is a complex and multi-dimensional concept that is challenging to measure and evaluate. Furthermore, many scientists interpret essence and substance of quality management in a different way (Kondrotaitė, 2012). The perception of quality in public services may vary depending on customer expectations, cultural background and personal experience. Moreover, the intangible nature of public services further complicates the process of assessing their quality (Yarmak & Rollnik-Sadowska, 2022; Ocampo et al., 2019). Therefore, it is important to understand and measure different dimensions of service quality that are relevant to customers and develop appropriate methods for evaluating and improving service quality in the public sector. Ultimately, the goal of providing high-quality public services is to meet customer needs and expectations and improve their satisfaction with the services they receive (Nor et al., 2022).

Public services are the primary means through which people interact with the public sector, and organisations offer a broad range of services to meet their needs and requirements. Although there is a diverse array of organisations and services provided in the public sector, most scientific research has focused on specific types of organisations and services. The majority of research has been conducted in the field of healthcare services (Gavahi et al., 2022; Rastoka et al., 2022; Dandis et al., 2022; Barrios-Ipenza et al., 2021; Sun & Li, 2020; Chin et al., 2020; etc.) and e-government (Ramakrishnan et al., 2022; Drobotowicz et al., 2021; Pedrosa et al., 2020; Wang & Teo, 2020; etc.) with a surge in interest since 2020. This growing interest can be attributed to the global pandemic, which highlighted the critical role of healthcare service providers and the transition to online services due to isolation measures. Recent studies on healthcare services have focused on topics such as healthcare quality, patient satisfaction and healthcare delivery. Meanwhile, research on e-government services has concentrated on such innovative technologies as artificial intelligence, electronic service quality and e-government adoption.

Although healthcare and e-government services have received increased attention since the pandemic, other types of public services maintained their level of attention during the analysed period. The literature review revealed a range of public services, including

transportation and communication (Bubalo et al., 2022; Uvenc & Kulluk, 2020; de Aquino et al., 2019; Houria & Fares, 2019; Chica-Olmo et al., 2018; etc.) with the focus on such issues as service quality, customer satisfaction and user experience; research on finance, audit and tax administration has addressed such topics as transparency, accountability and the effectiveness of public funding (Furqan et al., 2020; Greenwood & Zhan, 2019; Chaluvadi et al., 2018; etc.); the studies on utility supply and environmental management have examined such issues as service quality, environmental sustainability and customer satisfaction (Pereira et al., 2022; Marques & Simoes, 2020; Li et al., 2019; Andersson et al., 2019; etc.). Meanwhile, research on education has focused such on topics as educational quality, access to education and educational equity (Klein et al., 2022; Hassan et al., 2022; Demircioglu & Audretsch, 2019; Besley & Malcomson, 2018; Jemeljanenko, 2018; etc.); studies on employment have addressed such issues as job creation, workforce development and labour market policies (Akil et al., 2022; Ocampo et al., 2019; Mulinari, 2018; etc.); research on social services has examined such issues as social welfare, poverty reduction and community development (Mu et al., 2022; Kriel et al., 2021; Lapuente & Van de Walle, 2020; Szpilko et al., 2020, etc.); studies on business support have focused on such issues as entrepreneurship, innovation and small business development (Walsh et al., 2022; Harviainen et al., 2019; etc.); research on cultural and sports services has addressed such topics as cultural heritage preservation, sports event management and tourism development (Koronios et al., 2019; Tubillejas-Andres et al., 2019; etc.); and studies on legal services (Waibel et al., 2018; etc.) have examined such issues as access to justice and legal aid provision while research on law enforcement services has focused on such topics as crime prevention and public safety (Araujo & Franca, 2021; etc.).

It appears that while there is a considerable amount of literature on public sector services in general, there is still a lack of research specifically focusing on certain areas of public services, such as tourism, real estate management, fire protection and rescue. Additionally, the existing literature emphasises different aspects of public sector activity without a unified approach, making it difficult to fully reflect the problems of public service quality. Some publications focus on outsourcing (Aragao & Fontana, 2022; Solino, 2019; etc.), institutional trust (Tanny & Zafarullah, 2022), organisational reputation (Aladwan & Alshami, 2021), quality frameworks (Rodgers

et al., 2019), high-performance organisations (Kalimullah et al., 2019), excellence models (AlZawati et al., 2020), total quality management with quality leadership (Kim, 2020; AlShehail et al., 2022; Lopez-Lemus, 2021), entrepreneurship (Rojikinnor et al., 2020), public empowerment (Westrup, 2018), employee creative behaviour (Al Hosani et al., 2021), and knowledge management processes (Balasubramanian et al., 2019), among other factors that affect the overall performance of the organisation. Furthermore, financial context is also considered as researchers explore ways to increase the efficiency of services while maintaining or increasing quality (Fletcher, 2018) etc.

In recent years, researchers have focused on designing a service quality evaluation system (He et al., 2022). However, evaluating public service quality is a complex and challenging task due to the diverse nature of public services and their various stakeholders.

Additionally, the quality of public services is not only determined by the satisfaction of the service recipients but also by the expectations of society as a whole, which often go beyond the specific service outcomes. Therefore, this literature review is a necessary step towards identifying the main dimensions for assessing the quality of public services and providing insights for improving the quality of public services in Lithuanian organisations. This review allows for gaining a deeper understanding of the challenges and opportunities associated with the provision of public services and developing recommendations for enhancing the quality of public services.

1. Literature review

A literature review was conducted to examine recent publications on service quality in the public sector to identify prevailing trends in service quality assessment, key aspects and criteria of assessment, and gaps in current research. The Web of Science database was used to retrieve the latest scientific papers published in the past five years (2018–2022), using such keywords as "service quality", "public organisations", and "service quality of public organisations". The examined period covers two years before and after the COVID-19 pandemic, given the impact of the pandemic on public organisations. All publications were exported to the Zotero bibliography program, which facilitated the initial screening for

eligibility and the more in-depth analysis of articles. After the screening process, a total of 123 articles were analysed in detail, including 31 from 2022, 25 from 2021, 22 from 2020, 20 from 2019, and 25 from 2018.

The literature review highlighted the diversity and lack of unity among different types of public services. The distribution of scientific publications based on the type of public services is illustrated in Fig. 1. Public services were categorised according to the recommended classification of public services presented in Appendix 1. The review of recent literature revealed that a quarter of publications analysed public services in general without distinguishing any specific area of provided services, while the remaining publications were dedicated to a particular area of public services.

Despite variations in approaches to the public sector and its service quality indicators, studies can be categorised into three groups. The first group of research focuses on meeting customer needs and expectations. The second group comprises scientific research that emphasises the internal workings of public organisations and their employee attitudes towards work, as well as their motivation to provide quality services. The third research group is a mixture of both. The distribution of publications across these three groups is shown in Fig. 2.

The authors differentiate various quality indicators that can be used to measure service quality and customer satisfaction levels. However, researchers who examine public service quality from the customer's perspective concur that addressing and fulfilling the customer needs is crucial (Tanny & Zafarullah, 2022; Aladwan & Alshami, 2021; Chien & Thanh, 2022; Lim & Lee, 2021; Kelly et al., 2021). Given that customer expectations and satisfaction can be subjective and diverse, a multi-dimensional approach to measuring customer satisfaction is necessary, as evidenced by the varied service quality indicators leading to customer satisfaction identified by the authors. Examples of these indicators include promptness, helpfulness, benevolence, reliability, professionalism, honesty, and fairness (Tanny & Zafarullah, 2022); responsiveness and transparency (Lim & Lee, 2021); accessibility, reception, and handling of comments, feedback, and recommendations (Chien & Thanh, 2022) etc.

Additionally, the authors underscore that organisations can only provide quality public services by implementing a total quality management system (Lopez-Lemus, 2021; AlShehail et al., 2022). Research
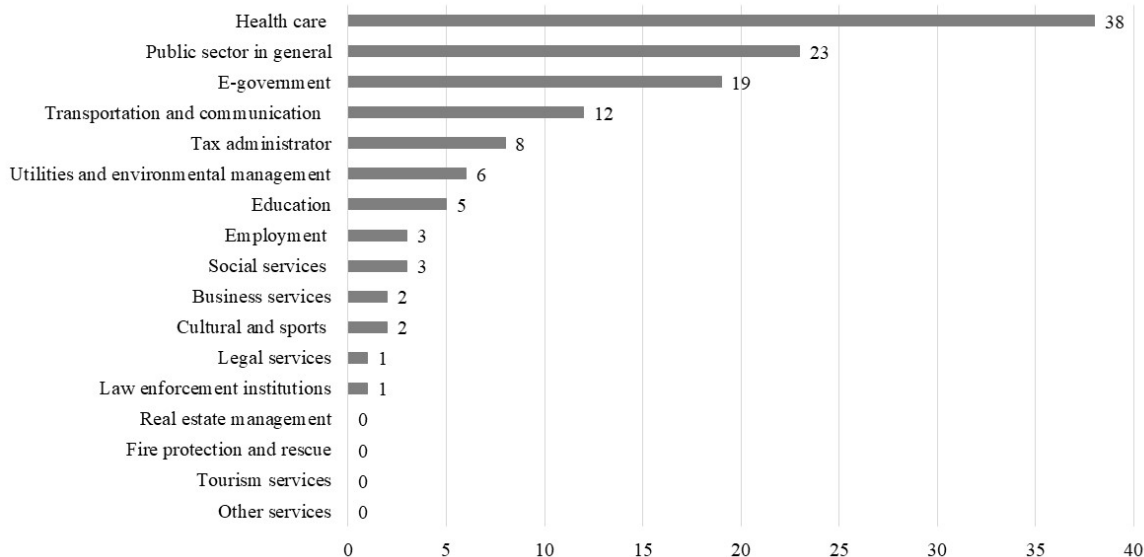
Fig. 1. Distribution of scientific publications according to the type of provided services (2018–2022)

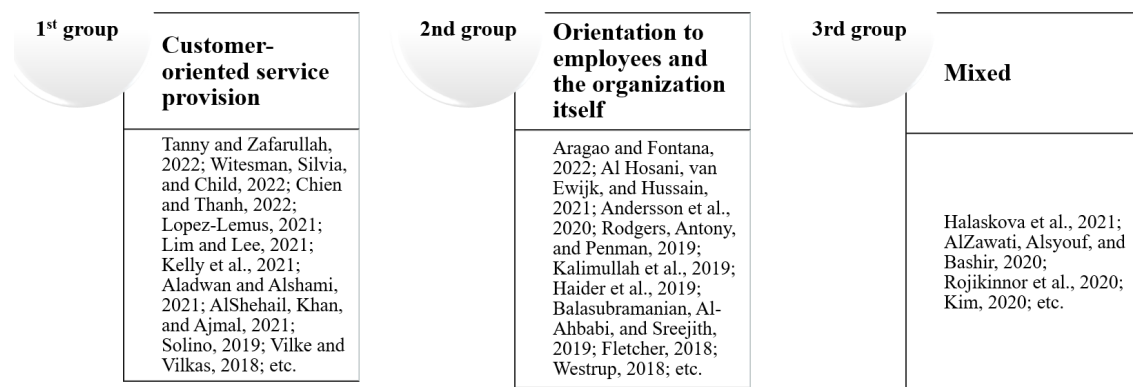| 1st group	Customer-oriented service provision	2nd group	Orientation to employees and the organization itself	3rd group	Mixed
	Tanny and Zafarullah, 2022; Witesman, Silvia, and Child, 2022; Chien and Thanh, 2022; Lopez-Lemus, 2021; Lim and Lee, 2021; Kelly et al., 2021; Aladwan and Alshami, 2021; AlShehail, Khan, and Ajmal, 2021; Solino, 2019; Vilke and Vilkas, 2018; etc.		Aragao and Fontana, 2022; Al Hosani, van Ewijk, and Hussain, 2021; Andersson et al., 2020; Rodgers, Antony, and Penman, 2019; Kalimullah et al., 2019; Haider et al., 2019; Balasubramanian, Al-Ahbabi, and Sreejith, 2019; Fletcher, 2018; Westrup, 2018; etc.		Halaskova et al., 2021; AlZawati, Alsyouf, and Bashir, 2020; Rojikinnor et al., 2020; Kim, 2020; etc.

Fig. 2. Distribution of scientific publications according to research orientation (2018–2022)

shows that the total quality management system can impact various dimensions of service quality, such as reliability, response capacity, assurance and empathy (Lopez-Lemus, 2021). Moreover, it can also drive digital transformation (Imran et al., 2022), service innovation (Tukiran et al., 2022) or sustainability performance in the public service sector (AlShehail et al., 2022).

It is imperative to note that while customer-oriented service provision is crucial, the employees of organisations providing such services play an equally vital role, thus making it a two-pronged process. Research suggests that customer service orientation has a positive impact on public employees' performance and work attitudes (Witesman et al., 2022). On the other hand, the delivery of quality services requires a combination of factors, such as skilled and experienced staff, outstanding infrastructure and operational management (Verma et al., 2022). Consequently, service quality can be viewed as a set of related but distinct dimensions comprising input (the bundle of service features) and output (the actual service outcome) (Shi & Cheng, 2021). The output dimensions include such aspects as reliability, thoroughness, efficiency, effectiveness and timeliness.

Following the literature review, articles were included analysing the public sector in general, without distinguishing services in specific areas but focusing on the customer. The selected service quality assessment indicators from recent articles were grouped for further analysis, as presented in Table 1.

The literature review identified public service quality indicators and grouped them into dimensions based on their shared characteristics. This grouping identifies ten service quality dimensions. Therefore, the empirical study was based on the premise that the

Tab. 1. Main quality indicators explored in scientific publications and their counterpart in the empirical model

BIBLIOGRAPHY	SERVICE QUALITY INDICATORS	DIMENSION
Aladwan & Alshami, 2021; Lopez-Lemus, 2021; Tanny & Zafarullah, 2022; Lim & Lee, 2021; Chien & Thanh, 2022	• organisational reputation • trustworthy behaviour • reliability • safety • inform users about the services they will receive • the reception and handling of comments • the results of the procedure settlement, etc.	Reliability
Tanny & Zafarullah, 2022; Lim & Lee, 2021; Lopez-Lemus, 2021; Kelly et al., 2021	• responsiveness • fastness • respond in a timely and timely manner • response capacity • promptness, etc.	Responsiveness
Tanny & Zafarullah, 2022; Lopez-Lemus, 2021	• prioritise the needs of users • competence • professionalism, etc.	Competence
Chien & Thanh, 2022; Witesman, Silvia & Child, 2022; Tanny & Zafarullah, 2022	• accessibility • availability of information • easy access to information, etc.	Access
Lopez-Lemus, 2021; Tanny & Zafarullah, 2022; Chien & Thanh, 2022	• courteous • civil servants' ethics and capacity • benevolence, etc.	Courtesy
Chien & Thanh, 2022; Kelly et al., 2021	• clarity • feedback, etc.	Communication
Witesman, Silvia, & Child, 2022; Lim and Lee, 2021; Lopez-Lemus, 2021; Tanny & Zafarullah, 2022	• transparency • assurance • institutional trust • honesty, etc.	Credibility
Kelly et al., 2021; Lopez-Lemus, 2021; Tanny & Zafarullah, 2022	• fairness • empathy • willingness to assist, etc.	Security
Chien & Thanh, 2022; Tanny & Zafarullah, 2022; Lopez-Lemus, 2021	• personalised attention to users • recommendations • helpfulness, etc.	Understanding
Lopez-Lemus, 2021; Vilke & Vilkas, 2018	• infrastructure • safe environment • interior design of the government office • seat in the waiting room • parking, etc.	Tangibles
AlShehail, Khan & Ajmal, 2022; Chien & Thanh, 2022; Tanny & Zafarullah, 2022; Lopez-Lemus, 2021; Vilke & Vilkas, 2018	• municipal objectives • doing the right thing for the country • administrative procedures • leadership • process-based approach • continuous improvement, etc.	Other

quality of public services, from a customer-oriented perspective, can be assessed using a complex of ten dimensions: Reliability, Responsiveness, Competence, Access, Courtesy, Communication, Credibility, Security, Understanding and Tangibles.

2. Research methodology

2.1. Instrument

The research focuses on the SERVQUAL model for assessing service quality, which was introduced by Parasuraman et al. (1985), who assessed consumer or service user attitudes towards the service providers' service quality. Service quality comprises the following ten factors: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, customer understanding and tangible devices and staff to provide services. Later, these ten items were collapsed into five dimensions, including tangibility, response, reliability, assurance, and empathy (Parasuraman et al., 1988).

Even though the SERVQUAL model, which consists of five dimensions, is most often used in scientific research to investigate service quality, the indicators distinguished during the literature review and their grouping show that a 10-dimensional SERVQUAL model should be used. A SERVQUAL model of the initially conceptualised ten service quality dimensions (Fig. 3.) was used to create the customer survey questionnaire.

Within the SERVQUAL framework, the questionnaire was structured and formulated so that each statement, which is positively worded, reflected one of the ten service quality dimensions. A 7-point Likert scale, with "7" representing strong agreement and "1" presenting strong disagreement, was used to measure how customers strongly agree or disagree with each quality dimension assessing the provision of public services, i.e., how customers perceive different aspects of public service quality and how unsatisfied or satisfied they are with different aspects of public service quality.

2.2. Sampling

The survey for collecting data was conducted by interviewing (May – September 2022) adult (18 y.o.) customers of Lithuanian organisations that provide public services. The interview was organised at the organisations' facilities after service provision.

Since according to 2022 statistics, Lithuania's adult population amounts to 2.311 mil., with a confidence level of 98 % and a margin of error of 2 %; the minimum required sample size is 3389. Data were collected from 3609 users of public services. The sample characteristics and their comparison with the population's characteristics are reported in Table 2.

The distribution of the sample according to different socio-demographic characteristics (gender, age, education, marital or employment status etc.) corresponds rather well with the characteristics of the whole population (Table 2). There is no possibility of comparing the sample with the population in terms of income level since this statistic for the population is not provided. The unknown population size and characteristics of the organisations that provide pub-

Reliability	Responsiveness	Competence	Access	Courtesy
• involves consistency of performance and dependability. It means that the organization performs the service right the first time as well as it means that the firm honors its promises.	• concerns the willingness or readiness of employees to provide service. It involves timeliness of service.	• means possession of the required skills and knowledge to perform the service. It involves: knowledge and skill of the contact personnel, knowledge and skill of operational support personnel, research capability of the organization.	• involves approachability and ease of contact. It means: the service is easily accessible by telephone, waiting time to receive service is not extensive, convenient hours of operation, convenient location of service facility.	• involves politeness, respect, consideration, and friendliness of contact personnel.

Communication	Credibility	Security	Understanding/knowing the customer	Tangibles
• means keeping customers informed in language they can understand and listening to them. It may mean that the company has to adjust its language for different consumers- increasing the level of sophistication with a well- educated customer and speaking simply and plainly with a novice.	• involves trustworthiness, believability, honesty. It involves having the customer's best interests at heart.	• is the freedom from danger, risk, or doubt. It involves: physical safety, financial security, confidentiality.	• involves making the effort to understand the customer's needs. It involves: learning the customer's specific requirements, providing individualized attention, recognizing the regular customer.	• include the physical evidence of the service: physical facilities, appearance of personnel, tools or equipment used to provide the service, physical representations of the service, such as a plastic credit card or a bank statement, other customers in the service facility.

Fig. 3. Service quality dimensions of the SERVQUAL model
Source: Parasuraman et al., 1985.

lic services challenged the authors to ensure a representative sample in terms of the type of the provided services. The overall number of organisations for which the customer data was collected was 392 (to ensure a representative sample size of organisations providing public services when the population size is unknown with a confidence level of at least 95 % and a margin of error of no more than 5 %). Organisations representing all service categories indicated in Appendix 1 were purposefully contacted to represent various types of services. It was assumed that the spatial (regional) distribution of organisations providing public services in Lithuania should follow the spatial (regional) distribution of the population. Therefore, quotas of organisations in each NUTS 3-level region were assigned according to Lithuania's regional population distribution (data for the year 2021).

2.3. Estimation strategy

Since the dependent variable is categorical and ordered, ordered logit and probit (for robustness check) models will be applied to examine the effect of socio-demographic characteristics and the type of service on customers' opinions about different quality aspects of the provided public services. A model for a single latent variable y* (different quality aspects of the provided public service are unobservable, it is only known when it crosses a threshold, i.e., it is not observed how the customer feels about the statement that corresponds to a particular quality aspect, seven categories are only observed ranging from strongly disagree to strongly agree) can be specified as follows:

$$y_i^* = x_i'\beta + \varepsilon_i, \qquad (1)$$

where x_i' stands for the vector of regressors, i.e., socio-demographic characteristics and a type of public services, ε_i stands for the error term, and β are parameters to be estimated. In this case, there is a latent continuous variable that would be formed into seven groups with six thresholds, which are cut-off points between seven different categories. If α is those thresholds, there would be $y_i = j$ if the underlying latent variable falls between the two thresholds, i.e., $\alpha_{j-1} < y_i^* < \alpha_j$. The probability for subject i to select alternative j is:

$$p_{ij} = p(y_i = j) = p(\alpha_{j-1} < y_i^* < \alpha_j) =$$
$$= F(\alpha_i - x_i'\beta) - F(\alpha_{i-1} - x_i'\beta) \qquad (2)$$

F is the logistic cumulative density function for the ordered logit, i.e., $F(z) = e^z/(1+e^z)$, and F is the standard normal cumulative density function for the ordered probit.

Tab. 2. Customer sample characteristics

CHARACTERISTICS		DISTRIBUTION		NUMBER OF OBSERVATIONS
		IN SAMPLE		
	IN POPULATION			
Gender[1]	Male	45.55%	44.17%	1594
	Female	54.45%	55.83%	2015
Age[1]	18–24	8.26%	9.11%	329
	25–34	15.53%	15.82%	571
	35–44	16.22%	17.63%	636
	45–54	17.13%	18.11%	654
	55–64	18.61%	18.05%	651
	65–74	12.88%	12.34%	445
	75–84	8.24%	7.80%	282
	85 and above	3.13%	1.14%	41
Education[2]	ISCED 0–2	12.62%	13.30%	480
	ISCED 3–4	50.95%	50.94%	1838
	ISCED 5–8	36.43%	35.76%	1291
Marital status[1]	Never married	25.94%	25.53%	921
	Married	50.58%	52.32%	1888
	Divorced	14.04%	14.08%	508
	Widow(er)	9.44%	8.07%	291

Employment status[1]	Employed	59.74%	69.83%	2520
	Unemployed	3.30%	9.84%	355
	Inactive	36.96%	20.34%	734
Counties (regions)[1]	Telsiai	4.64%	4.57%	165
	Panevezys	7.49%	7.92%	286
	Siauliai	9.24%	6.51%	235
	Taurage	3.21%	2.69%	97
	Vilnius	29.44%	31.28%	1129
	Utena	4.44%	4.66%	168
	Klaipeda	11.65%	12.52%	452
	Alytus	4.80%	5.24%	189
	Kaunas	20.28%	20.23%	730
	Marijampole	4.81%	4.38%	158
Family size[3]	1 person	28.30%	26.68%	963
	2 persons	25.90%	24.17%	872
	3 persons	18.60%	20.05%	724
	4 persons	18.10%	19.53%	705
	5 and more persons	9.10%	9.57%	345
The income per family member	Up to 500	-	20.14%	727
	500-700	-	23.83%	860
	701-900	-	21.09%	761
	901-1200	-	18.29%	660
	1200 and above	-	16.65%	601
The type of provided services	Employment	-	5.93%	214
	Law enforcement	-	2.05%	74
	Real estate management	-	3.85%	139
	Public transport and communication	-	6.68%	241
	Tourism	-	8.23%	297
	Legal	-	1.03%	37
	Other	-	2.91%	105
	Culture and sports	-	10.67%	385
	Business	-	6.43%	232
	Health care	-	7.76%	280
	Utilities and environmental management	-	8.06%	291
	Education	-	14.10%	509
	Social	-	10.17%	367
	Fire protection and rescue	-	6.70%	242
	Taxes administration	-	5.43%	196

Note: [1] 2022 statistics, [2] 2021 statistics, [3] 2019 statistics

3. ESTIMATION RESULTS

Analysis of the collected data about different dimensions of public service quality shows that Lithuanians are relatively non-demanding customers. The frequency distribution of all ten quality aspects indicates the clustering of opinions toward a more positive side (Fig. 4).

The 45° black line represents a case of neutral customers, i.e., the distribution along the 7-point Likert scale is even. The convex curve (not presented in Fig. 4) would show demanding customers unsatisfied with the quality of the public services. A concave
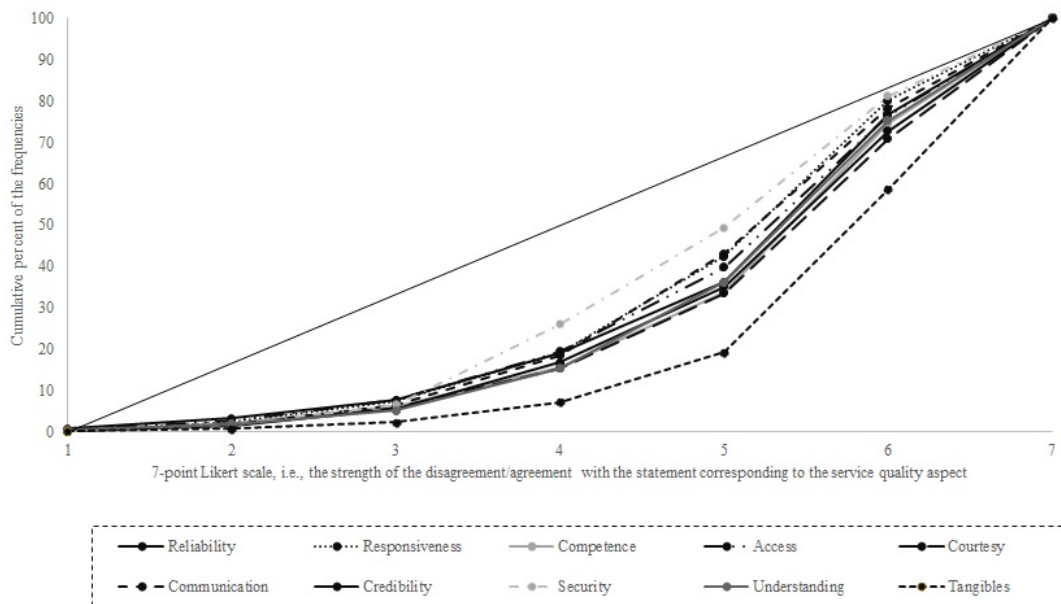
Fig. 4. Distribution of customer dissatisfaction/satisfaction about different aspects of public service quality

shape indicates non-demanding customers who agree with positively worded statements related to the service quality dimensions, i.e., expressing a high level of satisfaction with quality aspects of public services. In this case, all curves are concave, which means that the cumulative percentage of relatively dissatisfied customers (up to three on a 7-point Likert scale) is low (below 10 %), and the majority of customers (more than 50 %) are satisfied (five and more on a 7-point Likert scale).

The highest satisfaction is about the Tangibles aspect, and the lowest is about the Security aspect of the public services quality dimensions. All other curves intersect, and differences between quality dimensions are minuscular.

Analysing further quality perception heterogeneity among customers, customer socio-demographic characteristics and service types were regressed on different quality dimensions using ordered logit and probit models. Tables 3 and 4 report estimates of the ordered logit model. The estimates are rather consistent across ten quality dimensions and model types. Results of the robustness check using an ordered probit model are presented in Appendix 2. Indicators of a good fit indicated that all twenty estimations are reliable.

Tab. 3. Estimates of ordered logit model (1)

Factor	Regressor	Exp(β) or $1/exp(β)^{(1)}$				
		Reliability	Responsi-veness	Compe-tence	Access	Courtesy
Gender (*reference category – male*)	female	1.2***	1.28***	1.32***	1.16**	1.14**
Age	age	1.04**	1.06***	1.05***	1.04**	1.06***
	age²	1.00*	1.00***	1.00**	1.00**	1.00***
Education (*reference category – ISCED 3-4*)	ISCED 0-2	1.08	1.04	1.15	1.17*	1.14
	ISCED 5-8	1.22**	1.29***	1.2**	1.18**	1.29***
Occupation (*reference category – employed*)	unemployed	1.03	1.01	1.10	1.02	1.07
	inactive	1.54***	1.46**	1.38*	1.35*	1.36*
Family size	size	1.25**	1.39***	1.3	1.12	1.19
	size²	1.03*	1.04**	1.03	1.00	1.02
Marital status (*reference category – married*)	divorced	1.07	1.04	1.3**	1.17	1.06
	widow(er)	1.58***	1.43**	1.11	1.47**	1.09
	never married	1.26**	1.19	1.23*	1.25*	1.38***
Income per family member (*reference category – 701-900*)	up to 500	1.29**	1.26**	1.14	1.21*	1.38***
	500-700	1.21**	1.16	1.16	1.33***	1.21*
	901-1200	1.13	1.15	1.14	1.01	1.09
	1201 and above	1.08	1.10	1.07	1.22*	1.32**

County	Telsiai	1.23	1.11	1.26	2.43***	1.13
(reference category – Vilnius)	Panevezys	1.57***	1.4***	1.74***	1.19	1.02
	Siauliai	5.1***	4.79***	4.7***	3.16***	5.27***
	Taurage	1.85***	2.76***	2.98***	2.35***	3.63***
	Utena	1.66***	1.28	1.43**	1.02	1.07
	Klaipėda	1.00	1.09	1.09	1.36***	1.09
	Alytus	1.66***	2.61***	3.76***	2.67***	2.35***
	Kaunas	3.2***	2.47***	5.15***	3.52***	5.88***
	Marijampole	1.1	1.16	1.28	1.30*	1.14
Type of provided services	Employment	1.81***	1.47**	1.9***	1.89***	1.44**
(reference category – Education)	Law enforcement	2.22***	1.66**	2.09***	2.13***	2.14***
	Real estate management	1.50**	1.05	1.14	1.78***	1.09
	Public transport and commun.	1.29*	1.01	1.46**	1.62***	1.11
	Tourism	1.17	1.62***	1.07	1.16	1.79***
	Legal	1.52	1.02	1.45	2.15**	1.25
	Other	1.24	1.77***	1.61**	1.15	1.84***
	Culture and sports	1.14	1.67***	1.35**	1.07	1.8***
	Business	1.32*	1.32*	1.04	1.64***	1.22
	Health care	1.65***	1.47***	1.41**	2.24***	1.07
	Utilities and environ. manag.	2.06***	1.30*	1.72***	2.45***	1.27*
	Social	1.08	1.10	1.05	1.19	1.34**
	Fire protection and rescue	1.05	2.26***	1.32*	1.28*	1.73***
	Taxes administration	1.53***	1.02	1.63***	1.7***	1.28
Thresholds (intercepts), β	Cut1	-5.67***	-6.17***	-6.6***	-6.36***	-6.67***
	Cut2	-4.18***	-4.34***	-4.74***	-4.71***	-4.82***
	Cut3	-3.25***	-3.12***	-3.57***	-3.55***	-3.58***
	Cut4	-2.13***	-2.01***	-2.44***	-2.4***	-2.46***
	Cut5	-1.15***	-0.72*	-1.26***	-1.26***	-1.32***
	Cut6	0.84**	1.19***	0.83**	0.58	0.56
p-value of χ² for	-2 Log Likelihood test of model fitting	<0.001	<0.001	<0.001	<0.001	<0.001
	Pearson goodness-of-fit	0.360	0.335	0.384	0.375	0.355
	Deviance goodness-of-fit	0.530	0.564	0.549	0.487	0.532
	-2 Log Likelihood test of parallel lines, i.e., a test of proportional odds	0.438	0.489	0.424	0.417	0.406
Pseudo R²	Cox and Snell	0.157	0.158	0.221	0.175	0.205
	Nagelkerke	0.165	0.166	0.233	0.183	0.217
	McFadden	0.056	0.056	0.085	0.062	0.078
p-value of Likelihood ratio χ² test of model factors (df)	Education (2)	0.013	0.002	0.006	0.006	<0.001
	Occupation (2)	0.021	0.060	0.048	0.174	0.171
	Marital status (3)	0.024	0.126	0.058	0.059	0.056
	Income per family member (4)	0.012	0.020	0.085	0.012	0.015
	County (9)	<0.001	<0.001	<0.001	<0.001	<0.001
	Type of provided services (14)	<0.001	<0.001	<0.001	<0.001	<0.001

(1) We report the odds ratio for interpreting the effect magnitude. If the estimated β is negative, the odds ratio is below 1; thus, we report *1/exp(β)* instead of exp(β). Significance is based on the Wald χ² test. *, **, and *** represent the 90%, 95%, and 99% significance levels, respectively.

Tab. 4. Estimates of ordered logit model (2)

| | | Exp(β) or *1/exp(β)*[1] | | | | |
Factor	Regressor	Communi-cation	Credibility	Security	Understan-ding	Tangibles
Gender (reference category – male)	female	1.24***	1.06	1.07	1.25***	1.16**
Age	age	1.07***	1.05***	1.03*	1.03*	1.01
	age²	1.00***	1.00***	1.00	1.00	1.00
Education (reference category – ISCED 3-4)	ISCED 0-2	1.21**	1.26***	1.07	1.02	1.00
	ISCED 5-8	1.08	1.15*	1.18**	1.22**	1.22**
Occupation (reference category – employed)	unemployed	1.04	1.06	1.22**	1.29**	1.19*
	inactive	1.21	1.35*	1.18	1.31*	1.15
Family size	size	1.1	1.27	1.28**	1.19	1.04
	size²	1.00	1.03	1.03**	1.02	1.01

Marital status (reference category – married)	divorced	1.01	1.17	1.06	1.07	1.05
	widow(er)	1.49**	1.24	1.09	1.21	1.05
	never married	1.25**	1.06	1.16	1.4***	1.33**
Income per family member (reference category – 701-900)	up to 500	1.18	1.09	1.00	1.14	1.02
	500-700	1.22**	1.02	1.15	1.02	1.04
	901-1200	1.00	1.18	1.14	1.03	1.04
	1201 and above	1.18	1.03	1.08	1.15	1.49***
County (reference category – Vilnius)	Telsiai	1.03	1.39**	1.57***	1.63***	1.14
	Panevezys	1.42***	1.47***	1.09	3.32***	4.79***
	Siauliai	4.25***	2.95***	1.24	2.36***	3.67***
	Taurage	4.2***	5.66***	1.70***	1.37	2.07***
	Utena	1.36*	1.56***	1.30*	1.3*	1.64***
	Klaipėda	1.44***	1.20*	1.16	1.15	1.89***
	Alytus	1.78***	3.85***	2.46***	4.43***	11.55***
	Kaunas	3.85***	3.96***	2.14***	2.43***	4.61***
	Marijampole	1.05	1.56***	2.34***	1.45**	1.05
Type of provided services (reference category – Education)	Employment	2.16***	2.34***	1.07	1.05	1.19
	Law enforcement	2.43***	3.48***	1.96***	1.52*	1.65**
	Real estate management	1.7***	1.32	1.09	1.10	1.16
	Public transport and commun.	1.34**	1.19	1.19	1.02	1.56***
	Tourism	1.11	1.02	1.41**	1.61***	1.35**
	Legal	2.13**	2.23**	1.09	1.23	2.28**
	Other	1.53**	1.39	2.08***	1.93***	1.68**
	Culture and sports	1.13	1.26*	1.29**	1.65***	1.11
	Business	1.09	1.05	1.22	1.5***	1.49**
	Health care	1.68***	1.33**	1.19	1.13	1.00
	Utilities and environ. manag.	1.79***	1.77***	1.62***	1.36**	1.79***
	Social	1.11	1.07	1.63***	1.53***	1.12
	Fire protection and rescue	1.22	1.47**	1.78***	1.61***	1.27
	Taxes administration	1.51**	1.54***	1.24	1.07	1.16
Thresholds (intercepts), β	Cut1	-7.01***	-6.43***	-5.67***	-5.37***	-6.53***
	Cut2	-5.29***	-4.88***	-4.03***	-4.1***	-5.35***
	Cut3	-4.01***	-3.61***	-2.73***	-3.06***	-4.23***
	Cut4	-2.75***	-2.28***	-1.06***	-1.79***	-2.9***
	Cut5	-1.42***	-1.17***	0.05	-0.55	-1.53***
	Cut6	0.31	0.67	1.63***	1.32***	0.6
p-value of χ² for	-2 Log Likelihood test of model fitting	<0.001	<0.001	<0.001	<0.001	<0.001
	Pearson goodness-of-fit	0.350	0.345	0.310	0.337	0.340
	Deviance goodness-of-fit	0.583	0.530	0.590	0.538	0.503
	-2 Log Likelihood test of parallel lines, i.e., a test of proportional odds	0.418	0.461	0.435	0.485	0.460
Pseudo R²	Cox and Snell	0.148	0.178	0.103	0.138	0.219
	Nagelkerke	0.156	0.188	0.108	0.146	0.239
	McFadden	0.053	0.066	0.035	0.051	0.099
p-value of Likelihood ratio χ² test of model factors (df)	Education (2)	0.027	0.001	0.043	0.026	0.041
	Occupation (2)	0.504	0.181	0.111	0.023	0.224
	Marital status (3)	0.030	0.141	0.397	0.039	0.134
	Income per family member (4)	0.111	0.219	0.120	0.336	0.003
	County (9)	<0.001	<0.001	<0.001	<0.001	<0.001
	Type of provided services (14)	<0.001	<0.001	<0.001	<0.001	<0.001

(1) We report the odds ratio for interpreting the effect magnitude. If the estimated β is negative, the odds ratio is below 1; thus, we report $1/exp(β)$ instead of $exp(β)$. Significance is based on the Wald χ² test. *, **, and *** represent the 90%, 95%, and 99% significance levels, respectively.

4. DISCUSSION OF THE RESULTS

Statistically significantly different perceptions of public service quality were found between males and females for all dimensions except Credibility and Security. Depending on the estimation, a female is 1.14–1.32 times more likely to feel more positive about the quality of the provided services than a male. It seems that even controlling other socio-demo-

graphic characteristics, females are less demanding public service customers than males. The biggest differences observed were in the dimensions of Competence and Responsiveness. It is worth noting that an abundance of studies that emphasise Responsiveness as the most important attribute of public service quality (Javed & Ilyas, 2018; Ocampo et al., 2019; Meleddu, Pulina & Scuderi, 2020; Hassan & Salem, 2022; Gavahi, Hosseini & Moheimani, 2022; etc.).

Estimations show that the likelihood of being in the higher categories on a 7-point Likert scale and customers' age are in a curvilinear relationship except for dimensions of Security, Understanding, and Tangibles. A similar result was obtained by Vilke and Vilkas (2018), confirming that age influences the level of satisfaction with public services and that elderly respondents would be more dissatisfied with public services compared to the younger ones. In the same context, it was found that 48–58 y.o. customers are more likely to disagree with positively worded statements about public service quality compared with other age groups. It means that more demanding public service customers are 48–58 y.o.

Estimations suggest that educational attainment level is statistically significantly related to customers' opinions about service quality. The results are similar to the results of Gavahi, Hosseini and Moheimani (2022), who found that customers' education level has the biggest impact on their satisfaction with the services. Moreover, Meleddu, Pulina and Scuderi (2020) determined that a low level of education led to a low willingness to recommend services. In the research described in this article, for all dimensions, except for Credibility and Communication, customers with higher educational attainment levels (ISCED 5–8) were 1.18–1.29 times more likely to feel more positive about different quality aspects of the provided public services compared to customers with low (ISCED 1–2) and average (ISCED 3–4) educational attainment level. In the case of Credibility and Communication, a higher likelihood of positive evaluation was seen in a group of customers with low educational attainment levels compared with customers that fall in the other two groups.

Results show that occupation is significantly related just to the Reliability, Competence, and Understanding dimensions of public service quality. These findings support previous results on the relationship between satisfaction with public services and occupation, where occupation status is the most influential (Gavahi, Hosseini & Moheimani, 2022) and that unemployed residents are less dissatisfied

with public services (Vilke & Vilkas, 2018). In the research described in this article, it is more likely for an inactive customer to stronger agree with quality statements of Reliability and Competence compared to an employed or unemployed customer. In the case of the Understanding dimension, it is more likely for an unemployed customer to be more satisfied compared to an employed or inactive one.

In cases where the relationship is significant (Reliability, Responsiveness and Security dimensions), it is nonlinear between the family size and how strongly a customer agrees with the statement about service quality. Findings suggest the highest likelihood of possessing a positive view towards these quality dimensions of public services is for the families of four members after controlling other socio-demographic factors. Families of 1–3 or 5 and more members seem to be more demanding customers.

We do not find robust evidence that marital status would be crucial in explaining the heterogeneity of customer satisfaction with public services if other socio-demographic factors are controlled. Some evidence was obtained (in the case of Reliability, Communication and Understanding dimensions) that widows(ers) and/or never-married customers are more likely to stronger agree with these quality dimensions than married or divorced customers.

Findings suggest that income is an important factor in customer views towards public service quality in five out of ten dimensions (Reliability, Responsiveness, Access, Courtesy and Tangibles). It is more likely to feel more positive about these quality dimensions (except for Tangibles) for a person in lower income categories than a customer who falls in higher income categories. In the case of the Tangibles dimension, findings suggest the opposite. However, the research conducted by Meleddu, Pulina and Scuderi (2020) shows the opposite and claims that customers with low income are less willing to recommend services.

The findings clearly show that regional variation in customers satisfaction with the quality of public services is much greater than the variations observed in analysing other socio-demographic characteristics. Three groups of regions can be clearly distinguished. The first consists of Siauliai, Taurage and Kaunas counties. Customers in these counties are 1.7–5.9 (on average 3.6) times more likely to feel more positive about all quality aspects of public services compared to the reference (capital) county, Vilnius. In conclusion, customers are either the least demanding in Siauliai, Taurage and Kaunas counties, or the public

service quality is the best in these regions. The second group consists of Telsiai and Alytus counties. Customers in these counties are more likely, on average, to stronger disagree about the quality of the provided public services compared to the reference county. It suggests that customers in these two counties are either the most demanding or the service quality is the lowest. Mixed results were found in the third group, which includes Panevezys, Utena, Klaipeda and Marijampole. In some cases, customer satisfaction does not significantly differ from the capital county, or, in the case of statistically significant differences, there is no clear positive or negative trend considering a particular quality dimension. Territorial differences in customer satisfaction are also confirmed by Vilke and Vilkas (2018), who stated that residents from rural areas and towns were less dissatisfied with services than residents living in cities, but it could be influenced by the factor that public services are used more frequently in urban areas compared to rural areas (Verma, Kumar & Sharma, 2022).

Considering the type of the provided services, no such vast variation was observed in satisfaction as in the case of cross-county analysis. Still, estimated differences remain statistically significant even if controlling customers' socio-demographic characteristics. As a reference, the biggest "Education" service group was used. No statistically significant differences were found comparing customer satisfaction with "Social" and "Education" services. Satisfaction with all other types of public services statistically significantly differs from the reference group. A group of "Tourism", "Culture and sports", and "Fire protection and rescue" services can be distinguished. Customers of these public services are more likely to stronger agree about the quality of the provided services compared to the reference category. It can be assumed that customers are less demanding in consuming "Tourism" and "Culture and sports" as leisure services. Still, this assumption does not hold in the case of "Fire protection and rescue" services, which are of vital importance. Customers of all other types of public services, i.e., "Real estate management", "Public transport and communication", "Business", "Legal" and especially "Employment", "Law enforcement", "Health care", "Utilities and environmental management", and "Taxes administration", are more likely to be in lower categories evaluating different quality aspects of provided services compared to the reference category. It is especially alarming since this group consists of very important public services.

CONCLUSIONS

The conducted research measured user perceptions of the quality of public services. The literature analysis enabled the identification of service quality indicators, grouped them into dimensions according to unifying characteristics and grounded the methodology of the empirical study. The analysis of collected customer data revealed that the attitude towards different aspects of public service quality is generally positive, suggesting two possible explanations. First, the quality of public services in Lithuania is relatively high, and second, customers of public services in Lithuania are relatively non-demanding. Results applying logit and probit models and analysing deeper socio-demographic factors that might explain heterogeneity in attitudes suggest that higher-educated but inactive females younger than 48 or older than 58 living in families of 4–5 members are the most satisfied customers of public services. Findings show that marital status and income level are unrelated to customer satisfaction. Less educated 48–58-year olds, employed or unemployed males living in relatively small or big families are most likely to have a negative attitude towards the quality of public service. Although gender, age, family size, educational attainment level and employment status are significant factors explaining the heterogeneity of customer satisfaction, they still account just for a small fraction of variation compared to the place of residence and type of services. It suggests some conclusions. First, there are considerable differences in the level of public service quality across regions in Lithuania. Second, the level of customer demand depends on the type of public service.

The theoretical contribution and practical implications. The literature review and empirical research have uncovered a number of gaps in the research related to public services. First, it was found that the literature focuses predominantly on specific areas of public services, with very little research conducted on public services in general and none on such areas as tourism, real estate management, fire protection and rescue. Second, there is no unified and systematic standardised approach to evaluating the quality of public services. Third, the 5-component SERVQUAL model is insufficient to evaluate service quality, and researchers should return to the more detailed original 10-component SERVQUAL model. Fourth, the empirical research conducted found that standardised approaches to public services and quality assess-

ment are inadequate, and an individualised approach is needed. Furthermore, the research identified variations in the quality of public services across different sectors and socio-demographic groups, highlighting the importance of developing tailored service delivery models that cater to the specific needs and preferences of users. These findings emphasise the need for developing nuanced service delivery models that can accommodate unique characteristics and enhance the overall quality of public services.

Limitations and further research directions. The research measures user perceptions of public service quality. However, the study has several limitations. First, this research measured the quality of public services through ten dimensions. Still, it did not assess how important each of these dimensions was to the quality of public services. Therefore, the future research direction could be identifying the weight of each dimension for public service quality measurement. Second, the research is based on a customer-oriented approach. Future research can be aimed at assessing public organisations' employee perceptions of the services provided by their organisation and what internal factors of the organisation can affect the quality of the provided services. Third, the study does not directly investigate how much customers are satisfied with the quality of public services. Therefore, future research could fill this gap. Finally, future research on the quality of public services should identify improvement areas so that customer expectations are met on time and the public interest is fully protected.

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Appendix 1

Division of public services

Considering the diversity of services in the public sector, it is recommended to divide public services into certain groups according to the direction and nature of the provided services:

1. Employment services, such as job search, counselling, vocational guidance, retraining courses etc.
2. Utilities and environmental management services, such as waste management, water, gas, electricity, heat supply and sewage treatment, housing and building management administration, public environment management and maintenance services etc.
3. Cultural and sports services, such as services provided by cultural institutions and sports organisations, cultural and sports events and infrastructure intended to meet the cultural and sports needs of the population (museums, theatres, parks, sports fields, places for events).
4. Tax administrator services, such as income declaration, tax declaration processing, and tax consulting services.
5. Services for business issuing licenses and permits to business entities, providing support, services related to the promotion and development of small and medium-sized businesses, and training and consulting for representatives of small and medium-sized businesses.
6. Fire protection and rescue services, such as services intended for the protection of society, material property and the environment in emergency situations (firefighting and rescuing people, helping residents in domestic disasters, evacuation from places of emergency situations etc.).
7. Services related to real estate management, such as property registration, cadastral measurements, real estate valuation services, issuance of permits for construction, and renovation of buildings.
8. Social services, which are services providing assistance to a person (family) partially or completely unable to independently take care of personal (family) life and participate in public life due to age, disability or social problems; this group of services also includes social benefits and compensations, social insurance and benefits.
9. Transportation and communication services, such as public transport services, car parking and postal services.
10. Health care services, which are services provided by state health care institutions (services provided by emergency services, primary health care, treatment and wellness facilities, rehabilitation centres etc.).
11. Education services, which are services provided by formal and informal institutions, as well as informational, psychological, social pedagogical, special pedagogical and special help and health care at school, informational, consulting, qualification improvement and other help for educators.
12. Services of law enforcement institutions (police, courts, prosecutor's office etc.).
13. Legal services, i.e., primary and secondary legal assistance services, services of notaries and bailiffs.
14. Tourism services, which are services provided by tourism information centres etc.
15. Other services. This group of services includes services that cannot be assigned to any other group listed above (registration of civil status acts, issuance of personal documents, issuance of certificates and extracts, examination of complaints and requests).

Appendix 2

Tab. 2-1. Estimates of ordered probit model (1)

Factor	Regressor	Exp(β) or 1/exp(β)[(1)]				
		Reliability	Responsi-veness	Compe-tence	Access	Courtesy
Gender (*reference category – male*)	female	1.12***	1.16***	1.18***	1.1***	1.09**
Age	age	1.02**	1.04***	1.03***	1.02**	1.03***
	age^2	1.00*	1.00***	1.00**	1.00*	1.00***
Education (*reference category – ISCED 3-4*)	ISCED 0-2	1.04	1.02	1.08	1.11**	1.06
	ISCED 5-8	1.13***	1.16***	1.11**	1.09**	1.16***
Occupation (*reference category – employed*)	unemployed	1.02	1.00	1.08	1.01	1.04
	inactive	1.3***	1.22**	1.22**	1.20**	1.20*
Family size	size	1.12*	1.19***	1.14**	1.03	1.10
	size^2	1.01	1.02**	1.01	1.00	1.01
Marital status (*reference category – married*)	divorced	1.05	1.04	1.16**	1.11*	1.03
	widow(er)	1.29***	1.26**	1.06	1.22**	1.06
	never married	1.17**	1.13*	1.14**	1.17**	1.23***
Income per family member (*reference category – 701-900*)	up to 500	1.16**	1.15**	1.10	1.12*	1.22***
	500-700	1.12**	1.1*	1.11*	1.19***	1.13**
	901-1200	1.07	1.08	1.08	1.01	1.05
	1201 and above	1.05	1.05	1.03	1.11*	1.18**
County (*reference category – Vilnius*)	Telsiai	1.17*	1.09	1.16	1.58***	1.08
	Panevezys	1.3***	1.23***	1.30***	1.07	1.01
	Siauliai	2.61***	2.41***	2.46***	1.9***	2.62***
	Taurage	1.35***	1.75***	1.88***	1.55***	1.94***
	Utena	1.31***	1.16*	1.26**	1.02	1.04
	Klaipėda	1.03	1.01	1.08	1.23***	1.02
	Alytus	1.3***	1.73***	2.09***	1.72***	1.59***
	Kaunas	2.03***	1.75***	2.67***	2.18***	2.89***
	Marijampole	1.07	1.07	1.18*	1.18*	1.07
Type of provided services (*reference category – Education*)	Employment	1.47***	1.25**	1.56***	1.47***	1.22**
	Law enforcement	1.58***	1.40**	1.61***	1.59***	1.52***
	Real estate management	1.28**	1.03	1.11	1.45***	1.06
	Public transport and commun.	1.16*	1.01	1.29***	1.37***	1.07
	Tourism	1.1	1.33***	1.02	1.11	1.39***
	Legal	1.24	1.00	1.3	1.60***	1.18
	Other	1.16	1.4***	1.3**	1.09	1.46***
	Culture and sports	1.07	1.32***	1.15*	1.03	1.38***
	Business	1.18*	1.18*	1.03	1.33***	1.12
	Health care	1.37***	1.25***	1.27***	1.64***	1.06
	Utilities and environ. manag.	1.54***	1.18**	1.40***	1.72***	1.15
	Social	1.05	1.07	1.03	1.13	1.20**
	Fire protection and rescue	1.03	1.60***	1.13	1.12	1.40***
	Taxes administration	1.26**	1.01	1.35***	1.37***	1.15
Thresholds (intercepts), β	Cut1	-3.02***	-3.19***	-3.36***	-3.33***	-3.39***
	Cut2	-2.38***	-2.45***	-2.62***	-2.66***	-2.68***
	Cut3	-1.92***	-1.87***	-2.07***	-2.10***	-2.10***
	Cut4	-1.30***	-1.26***	-1.45***	-1.46***	-1.50***
	Cut5	-0.72***	-0.49**	-0.76***	-0.79***	-0.83***
	Cut6	0.48**	0.65***	0.48**	0.32	0.29
p-value of χ^2 for	-2 Log Likelihood test of model fitting	<0.001	<0.001	<0.001	<0.001	<0.001
	Pearson goodness-of-fit	0.380	0.342	0.322	0.396	0.373
	Deviance goodness-of-fit	0.551	0.567	0.587	0.530	0.591
	-2 Log Likelihood test of parallel lines, i.e., a test of proportional odds	0.407	0.403	0.423	0.481	0.482
Pseudo R^2	Cox and Snell	0.165	0.163	0.223	0.178	0.207
	Nagelkerke	0.173	0.171	0.236	0.186	0.218
	McFadden	0.059	0.058	0.086	0.063	0.078
p-value of Likelihood ratio χ^2 test of model factors (df)	Education (2)	0.010	0.001	0.008	0.006	<0.001
	Occupation (2)	0.011	0.079	0.015	0.106	0.152
	Marital status (3)	0.018	0.054	0.055	0.040	0.028

	Income per family member (4)	0.011	0.018	0.055	0.014	0.009
	County (9)	<0.001	<0.001	<0.001	<0.001	<0.001
	Type of provided services (14)	<0.001	<0.001	<0.001	<0.001	<0.001

(1) We report the odds ratio for interpreting the effect magnitude. If the estimated β is negative, the odds ratio is below 1; thus, we report *1/exp(β)* instead of exp(β). Significance is based on the Wald χ^2 test. *, **, and *** represent the 90%, 95%, and 99% significance levels, respectively.

Tab. 2-2. Estimates of ordered probit model (2)

Factor	Regressor	Exp(β) or *1/exp(β)*[1]				
		Communi-cation	Credibility	Security	Understan-ding	Tangibles
Gender (*reference category – male*)	female	1.13***	1.04	1.05	1.14***	1.1**
Age	age	*1.04****	*1.03****	*1.02***	*1.02***	*1.00*
	age²	1.00***	1.00**	1.00*	1.00	*1.00*
Education (*reference category – ISCED 3-4*)	ISCED 0-2	*1.11***	*1.14***	*1.05*	*1.02*	1.00
	ISCED 5-8	1.06	1.09*	1.11**	1.13***	1.11**
Occupation (*reference category – employed*)	unemployed	1.00	1.02	1.11*	1.13**	1.10
	inactive	1.10	1.21**	1.06	1.18*	1.11
Family size	size	1.05	1.15**	1.15**	1.08	1.02
	size²	*1.00*	*1.02*	*1.02**	*1.01*	*1.01*
Marital status (*reference category – married*)	divorced	*1.01*	1.08	1.01	1.05	1.05
	widow(er)	*1.24***	1.12	1.05	1.14	1.07
	never married	*1.17***	1.05	*1.13**	1.24***	1.18**
Income per family member (*reference category – 701-900*)	up to 500	*1.1*	*1.06*	1.01	1.05	*1.02*
	500-700	*1.13***	*1.03*	*1.06*	*1.01*	*1.03*
	901-1200	*1.01*	1.1	*1.11**	*1.02*	*1.03*
	1201 and above	*1.11*	*1.03*	1.07	*1.06*	1.28***
County (*reference category – Vilnius*)	Telsiai	*1.00*	*1.2***	*1.32****	*1.35****	*1.08*
	Panevezys	1.21***	1.21***	*1.08*	1.87***	2.17***
	Siauliai	2.29***	1.81***	*1.08*	1.59***	2.1***
	Taurage	2.21***	2.63***	*1.33***	*1.15*	1.39***
	Utena	*1.2***	1.29***	*1.17**	*1.14*	1.30***
	Klaipėda	1.14**	1.06	1.01	*1.14***	1.39***
	Alytus	*1.4****	2.19***	1.75***	2.34***	*3.61****
	Kaunas	2.22***	2.28***	1.59***	1.72***	2.43***
	Marijampole	*1.00*	1.30***	1.62***	*1.25***	1.03
Type of provided services (*reference category – Education*)	Employment	*1.58****	*1.61****	*1.05*	*1.06*	*1.11*
	Law enforcement	*1.66****	*1.99****	*1.46****	*1.27**	*1.32**
	Real estate management	*1.35****	*1.17*	*1.07*	1.05	*1.10*
	Public transport and commun.	*1.19***	*1.12*	1.07	*1.04*	*1.33****
	Tourism	1.08	1.02	1.21**	1.27***	1.14
	Legal	*1.54***	*1.64****	*1.11*	*1.18*	*1.77****
	Other	1.28**	1.23*	1.51***	1.5***	1.35**
	Culture and sports	1.06	1.11	1.12	1.29***	1.01
	Business	*1.04*	*1.00*	1.09	1.27***	1.31***
	Health care	*1.37****	*1.21***	*1.14*	*1.12*	*1.02*
	Utilities and environ. manag.	*1.39****	*1.41****	*1.38****	*1.22***	*1.4****
	Social	*1.06*	*1.04*	1.32***	1.27***	*1.08*
	Fire protection and rescue	1.15	1.26**	1.39***	1.27***	1.12
	Taxes administration	*1.27***	*1.28****	*1.17**	1.02	*1.08*
Thresholds (intercepts), β	Cut1	-3.6***	-3.26***	-2.94***	-2.79***	-3.07***
	Cut2	-2.95***	-2.67***	-2.31***	-2.31***	-2.70***
	Cut3	-2.35***	-2.10***	-1.71***	-1.84***	-2.26***
	Cut4	-1.66***	-1.39***	-0.79***	-1.19***	-1.65***
	Cut5	-0.87***	-0.74***	-0.11	-0.46*	-0.94***
	Cut6	0.17	0.37	0.84***	0.67***	0.31

p-value of χ^2 for	-2 Log Likelihood test of model fitting	<0.001	<0.001	<0.001	<0.001	<0.001
	Pearson goodness-of-fit	0.354	0.354	0.361	0.397	0.353
	Deviance goodness-of-fit	0.548	0.598	0.511	0.558	0.590
	-2 Log Likelihood test of parallel lines, i.e., a test of proportional odds	0.431	0.456	0.437	0.456	0.471
Pseudo R^2	Cox and Snell	0.151	0.178	0.107	0.137	0.201
	Nagelkerke	0.158	0.187	0.112	0.144	0.220
	McFadden	0.054	0.066	0.036	0.050	0.090
p-value of Likelihood ratio χ^2 test of model factors (df)	Education (2)	0.026	0.001	0.017	0.018	0.079
	Occupation (2)	0.585	0.139	0.192	0.055	0.224
	Marital status (3)	0.022	0.175	0.226	0.013	0.127
	Income per family member (4)	0.089	0.159	0.078	0.582	0.002
	County (9)	<0.001	<0.001	<0.001	<0.001	<0.001
	Type of provided services (14)	<0.001	<0.001	<0.001	<0.001	<0.001

(1) We report the odds ratio for interpreting the effect magnitude. If the estimated β is negative, the odds ratio is below 1; thus, we report *1/exp(β)* instead of exp(β). Significance is based on the Wald χ^2 test. *, **, and *** represent the 90%, 95%, and 99% significance levels, respectively.