

# Factors Determining User Satisfaction with Counter Services of Local Government Offices: On-Site Survey at Higashihiroshima City Hall, Japan

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## Research Article

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# Abstract

This study empirically investigated the major factors determining customer satisfaction with counter services in local government offices in Japan, comparing them with the results of similar surveys conducted in 2020. It considers visitors' direct experience of counter services through an on-site survey conducted at a municipal government building, including (1) customer satisfaction research in various countries, especially the expectancy disconfirmation model; (2) the SERVQUAL model; and (3) subsequent methods emphasising customer's direct experience. SERVQUAL is a five-group scale for evaluating service quality with respect to customer satisfaction. However, in actual organisational settings, five groups of questions may be burdensome to respondents and may reduce the collection rate. This research involves conducting on-site surveys on customer satisfaction or service quality of the local government office using an original three-group questionnaire scale and tailoring the question items to a scale for Japanese local administration settings. A total of 1,000 questionnaires were distributed over four weekdays at the City Hall. As of September 27, 2021, there were 537 respondents (response rate: 53.7%). Regression analysis indicated that the independent variables of group C (service delivery) were most influential, followed by those of groups B (human-related factors) and A (office hardware) (adjusted  $R^2$  value: .58). This is consistent with the results of a previous survey of users of Osaka City Government's ward offices. Focusing on the second principal component of the service delivery category (C), promptness and short waiting times do not necessarily affect customer satisfaction positively. The author's scale, which is a 3-group scale, is less than SERVQUAL's 5-group scale. The validation of a simple three-group scale for public facility user satisfaction provides useful insights for local government practitioners seeking to conduct similar satisfaction surveys and offers methodological suggestions for researchers examining service satisfaction in public and private service organizations.

# Introduction

The study and practice of customer satisfaction in the private sector have progressed over several decades, with a focus on service quality. This shift is related to goods provided by private companies shifting from tangible to intangible goods or service goods. In the field of public administration, research on the relationship between service quality and other variables is ongoing. Recently, Ziller and Andreß (2021) examined the relationship between quality, efficiency, and fairness of local public service provision and social trust in European cities using cross-sectional survey data over time. As the Literature Review discusses in detail, the background theory of research on customer satisfaction began with Oliver and Winer's (1987) expectancy disconfirmation model, which led to the development of the SERVQUAL model by Parasuraman, Zeithaml, and Berry (1988) and an increasing number of empirical studies in various sectors based on it. The University of Michigan's Johnson and Gustafsson (2000) put forward a model diagram concerning customer satisfaction with convenience stores on p. 65 of their Chapter 4, showing that multiple factors comprising multiple questions that affect customer satisfaction lead to enhanced reputation and customer loyalty; in Chapter 5, they summarise the method computing each question group of factors into synthetic variables using principal component analysis, and demonstrate

how the most influential factors by multiple regression analysis using these compound variables are examined. SERVQUAL, as the name suggests, is a five-group scale for evaluating service quality with respect to customer satisfaction. However, in actual organisational settings, five groups of questions may be burdensome to respondents and reduce the collection rate. The author's research involves conducting on-site surveys on customer satisfaction or service quality of a local government office using an original three-group questionnaire scale referring to the similar simplified framework of three groups of question items applied in Malaysia by Mansor and Razali (2010) and tailoring the question items to a scale for Japanese local administration settings. Furthermore, Talib and Shukor (2016) conducted a factor analysis for each question and found that it was appropriate to divide the questionnaire into three groups. The use of fewer question groups, and consequently, fewer total questions, is expected to reduce respondents' burden and increase the response rate. The development of a simple method with equivalent measurement capabilities has methodological significance for customer satisfaction research, and has practical advantages in terms of practical application. Using Principal Component Analysis regression for quantitative research on the determinants of customer satisfaction was introduced by Johnson and Gustafsson (2000) at the University of Michigan, the most prominent example and their book has been translated and published in Japan and is widely referenced worldwide.

The study of customer or citizen satisfaction in public administration in Japan was derived and developed from the research and practice of policy evaluations and government evaluations with an awareness of the issues of local government reform. Mie Prefecture, in central Japan, implemented a government evaluation system during the 1990s. Local governments across the country followed suit, implementing government evaluation systems. This movement influenced the central government to enact a law mandating all ministries to carry out three types of policy evaluations—performance assessment, programme evaluation for constructing infrastructure, and general evaluation with several perspectives—in 2002. Several studies using surveys have indicated that large municipalities, such as cities, are more assertive in incorporating policy evaluations into local governments' operational activities than small ones, such as towns and villages (Moteki 2015; Tabuchi 2010). Evaluation activities that can be applied to individual concrete situations are now required, and these can be developed through the improvement of more specific operations and introduction of more specific methods of evaluation practice (for the current status of government evaluations in Japan, see Moteki 2020). These circumstances necessitate that Japanese municipalities apply evaluation activities to specific conditions through the improvement of more specific operations and the introduction of new methods. More diversified methods are required for specific organisational needs, such as programme satisfaction surveys targeting citizens and the use of logic models. *Shisaku Manzoku-do Chosa*, that is, the Programme Satisfaction Survey—also known as the 'citizen satisfaction survey'—focuses on the level of importance of and satisfaction with all programmes and analyses them in four quadrants.

Many municipalities, including the city of Higashihiroshima, survey citizen satisfaction with programmes and focus on the level of importance of and satisfaction with each programme. As the survey targets municipal residents, their perceptions and behaviours related to a wide range of local government programmes can be collected by mail. Based on the answers, each programme is placed in one of the

four quadrants decided by the two elements of importance and performance. Contrastingly, a few municipalities in Hiroshima Prefecture, such as Kumano Town, survey visitors to the office, focusing on customer satisfaction with counter services. Subsequently, more specific surveys of customer satisfaction emerged in the form of on-site counter-service satisfaction surveys to improve the operations of government offices. For example, Kumano Town in Hiroshima Prefecture has focused on customer satisfaction with counter services. They implemented an on-site survey in 2009 (Kumano Town 2009) and continued conducting similar surveys regularly. Moreover, the city of Ogaki, in Shiga Prefecture, performed a questionnaire survey of 2,000 residents by mail to help consider the rebuilding of a City Hall (Ogaki City Government 2014). The response rate was 47.7%. The residents were questioned about their experience during a previous visit, the purpose of that visit, the means of transportation used, and their experiences with the counter service.

In Japan, according to the CiNii Database, an official article database, the earliest reference to customer satisfaction was in the title of the 1984 paper, 'Customer Satisfaction Survey at Sekisui Heim', published in the *Journal of the Japanese Society for Quality Control*. This is the result of a search in Japanese for *Kokyaku Manzokudo* [customer satisfaction] in the database. Sekisui Heim is the housing brand of the Sekisui Chemical Group, a house builder focusing on detached houses. This was four years after Oliver (1980) published his discussion of satisfaction based on expectancy disconfirmation theory, and since then, in Japan, the term 'customer satisfaction' has been used, and practice and research have developed mainly in the private sector. Quality Control (QC) is a production control method developed in Japan by *Nikkagiren* [Union of Japanese Scientists and Engineers], a foundation operated in cooperation with the Japanese business community, academia, and government, to improve and streamline production management, mainly in private companies, using scientific methods including statistics, for industrial development. QC is characterized by discussions and improvement proposals for production improvement in small groups in the workplace. The improvement movement in these small groups is known as QC Circle, and during the period when the Japanese economy was booming, it attracted attention from large foreign companies and was adopted into practice by some companies. It was used both to mean Quality Control and Quality Circle, an abbreviation of QC Cercle. The practice of this method at Toyota Motor Corporation, Kaizen, has become world-renowned both for its practice in the corporate management field and the research undertaken since. The method was often referred to as Total Quality Control; however, since then, it became part of the name of the academic journal overseas (*The TQM Journal*), and is now called *Total Quality Management* (TQM) around the world—in Japan, *Nikkagiren* began calling it TQM in 1996. The term customer satisfaction is used in case studies of TQM in Japan, such as the case study of the kaizen movement at Shiseido, a cosmetics company in Japan.

Research on policy evaluation and administrative evaluation in Japan has focused mainly on the introduction of overseas evaluation theories and the examination of advanced examples of domestic practice, such as the evaluation system for administrative projects. However, research from the perspective of specific methods to improve actual evaluation practices based on overseas evaluation theories, i.e. evaluation research based on logic model methods and service quality assessment using SERVQUAL methods, has not progressed much. This study enables us to grasp the factors that determine

the level of satisfaction with counter services and examine the constituent items of each group to understand those aspects that lead to the improvement of customer satisfaction with government office counter services scientifically and academically.

This study is unique because it provides suggestions for practical use through on-site research at Higashihiroshima City Hall. Therefore, it applied the method adopted by research in the business field investigating private corporations. Noda (2013, 2014, 2019) already focuses on the citizen satisfaction concept when dealing with residents of local governments in Japan by conducting survey studies.

A search of Google Scholar, an extensive database of articles using the keyword 'customer satisfaction' reveals many research papers from private companies and government agencies in Malaysia. Similar to this study, Mansor and Razali (2010), using a three-group Customer Satisfaction survey scale, is one such Malaysian study. The rise of public-private research focusing on customer satisfaction in Malaysia is probably due to the Look East policy of President Mahathir, who served as president of the country from 1981 to 2003. The Look East policy, as its name suggests, sought to emulate the post-war economic recovery of Japan, located east of Malaysia, in its socio-economic institutions and methods of corporate management that had led to the country's economic recovery.

The term Customer Satisfaction is not as often used regarding public organizations, such as the government, as it is used in research within the private sector. The concept of citizen satisfaction is often used to describe satisfaction in the public administration field, as Zhang et al. (2022) used it in the title of their paper, wherein they conducted a meta-analysis of studies based on The Expectancy-Disconfirmation Model. However, for the author's research on satisfaction in the field of public administration published in 2021 and 2022, the author included 'customer satisfaction', and not 'citizen satisfaction', in the titles of the papers. The reasons for this are (1) in the field of local government, which is the subject of the author's research, the customers of local governments include registered Japanese citizens and foreigners, and (2) the term 'citizen satisfaction' is usually used at an abstract level in relation to multiple policies of local governments in general. Additionally, those levels of analysis differ from that of satisfaction surveys conducted at specific, concrete administrative facilities, as in the author's study. Using the concept of customer satisfaction is also disadvantageous as the private-sector corporate image of the concept may impede the understanding of the research collaborators and may be misunderstood by other researchers as a sign of normative awareness that 'private-sector management methods should be applied to public organizations'.

Instead, the author uses the term 'user satisfaction' in this study to clarify that the focus of the survey is on the level of satisfaction with the counter service provided by public facilities. In empirical studies on public administration, Alemán, et al. (2018), Lauritzen, et al. (2021), and others use the concept of user satisfaction for services provided by administrative agencies and facilities. In the health care administration field, the neighbourhood of public administration, patient satisfaction research has evolved and is moving toward the study of patient experience (PX). The author will examine the factors contributing to satisfaction by focusing on the series of experiences of each surveyed user when they

enter a public facility, complete their errands, and leave the building. Some surveys under the premise of citizen satisfaction are based on expectancy disconfirmation theory, but on long-term memories or survey citizens' evaluations of policies and services that they have not actually experienced. One such example is the policy satisfaction surveys conducted by local governments in Japan, many of which use the postal mail method and are opinion surveys on consumer expectations (importance) and evaluations (perceived outcomes) of a wide range of service measures provided by the local government. The author's study is premised on expectancy disconfirmation theory as an explanation of the mechanism that causes satisfaction; however, the purpose of the study is not to verify the validity of the theory itself, but rather to focus on user satisfaction, or the actual experience of users at public facilities, and empirically examine factors that improve it.

The SERVQUAL five-group question scale, a tool for specific research on Satisfaction, was initially used in the private sector and is now also used by public institutions and a wide range of public sectors, including museums and art galleries. Studies using SERVQUAL use the concept of service quality in the title of the paper. Quality control has been focused in discussions only since the 1980s. Later, the discussion of quality control shifted from industrial products to mass consumer goods, such as cosmetics, and then, to the provision of intangible goods as the economy became more service-oriented, or as the tertiary industry became the center of the economy, and in this respect, the focus on satisfaction and service quality has arisen simultaneously. However, the two concepts have some things in common in certain areas and do not overlap in other areas. Based on a survey of firms in three service areas, Lee, et al.'s (2000) analysis showed that perceived service quality is a predecessor variable of satisfaction and not its opposite. Likewise the author believes that service quality is one factor that determines satisfaction. Although the subjective perception of service quality overlaps significantly with that of satisfaction, the author will focus on the term satisfaction and use service quality as a subordinate concept, considering the accumulation of past research and practice in which customer satisfaction was also emphasized in mass consumer goods, such as cosmetics.

The SERVQUAL scale is characterized by the calculation of the value of the difference between expectations and the actual situation for each item, based on expectancy disconfirmation theory. Based on the results of a survey in Italy, Giannoccaro et al. (2008) showed that using the values of performance as perceived by respondents is superior to using difference values in terms of reliability and validity; it also saves time in the calculation. The fact that the difference between expectations and perceived performance largely dictates satisfaction is supported by several studies in the field of public administration (Zhang et al. 2022), but with an eye toward application to practice, it is important to examine the factors governing satisfaction that are relatively important within the control of the service provider. This study mainly aims to determine whether user satisfaction can be adequately explained by principal component regression analysis by placing respondents' perceived accomplishments at the center of the questionnaire, although this study acknowledges that expectancy disconfirmation theory is premised as an explanatory theory of the satisfaction mechanism. Furthermore, to reduce the researcher's burden of analysis and the respondent's burden of filling the form, and to survey only perceived

performance without using difference values, we propose a unique three-group scale, fewer than the five groups in SERVQUAL, and test its usefulness through principal component regression analysis.

This study used an academic approach to examine the determinants of satisfaction with counter services. In other words, the focus is on the counter service among the services provided by local governments. This study involved a multi-group questionnaire survey of residents, and statistically examined factors affecting the overall customer satisfaction level with counter service using selective multi-group principal component regression analysis (Takahashi and Kawasaki 2019), which combines principal component analysis and multiple regression analysis. Everitt (2005) mentions that in the method of applying principal component analysis, multiple question items can be grouped into several categories before the combined principal component scores of explanatory variables are used in the multiple regression analysis. Thus, the use of the principal component score can weaken the multicollinearity problem between each question item used in the regression analysis. In addition, this study compares the results of the survey conducted by the authors at Higashihiroshima City Hall with those implemented at the Kurose branch office in 2020 and the Internet survey of other cities. Based on Mansor and Razali (2010), the questionnaire includes three groups of factors: hardware, including physical aspects such as buildings and access; software, including staff response, among others; and service delivery. Hardware, which was relatively unimportant in relation to the cost explanatory variables in the regression analysis of the Kurose branch survey results, is examined in more detail in this survey.

This study compares the results of the 2020 and 2021 surveys conducted at the Kurose branch office and Higashihiroshima City Hall, respectively. The current municipal territory of Higashihiroshima city was formed by the municipal merger of the old Higashihiroshima city and the five towns of Kurose, Fukutomi, Toyosaka, Kochi, and Akitsu in February 2005. Its population was 189,196 as of July 31, 2021 (Higashihiroshima City Government 2021), and it ranks fourth in terms of population in Hiroshima Prefecture. The new city established branch offices in the five towns consolidated in 2005. These branch offices perform most of the counter service functions executed by the old towns before the municipal merger, except for affairs related to city-wide policy decision-making such as urban planning. Citizens can carry out many administrative procedures at nearby branch offices even after the merger. Accordingly, a survey was conducted in the Kurose branch office in August 2020, and another was performed at Higashihiroshima City Hall in August 2021 as a part of the present study. The results of the survey at the Kurose branch showed that human factors were most important for overall satisfaction, similar to the study by Mansor and Razali (2010). Author (2021) presents the results of an Internet survey of ward offices in Osaka city; in a survey of those offices, the regression analysis found that the composite variable of the service delivery quality factor was the most important, unlike the results for the Kurose branch office. After confirming that the factors governing customer satisfaction differed depending on urban/suburban areas and the accuracy of administrative facilities, the main objective of this study was to empirically examine the factors governing customer satisfaction in the main office building of the city hall of a regional city with a population of less than 200,000 and to obtain clues for making practical improvements to administrative services. This study also aims to verify the usefulness of the author's scale by utilising the three groups of customer satisfaction survey scales proposed by the author and

examining the coefficient of determination of the regression analysis under different circumstances, City Hall of a local city in Japan.

This study seeks to identify the primal factors that influence the level of satisfaction with counter services, in a way similar to the research methodology presented by Johnson and Gustafsson (2000) at the University of Michigan. Using a similar set of questions as SERVQUAL, Talib and Shukor (2016) conducted a factor analysis for each question and found it appropriate to divide the questionnaire into three groups. Fewer question groups, and consequently, fewer total questions, are expected to reduce the respondents' burden and increase the response rate. The development of a simple method with equivalent measurement capabilities has methodological significance for customer satisfaction research and has advantages in terms of practical application. To explore the determinants of customer satisfaction and to compare it with the survey already conducted in 2020 at the Kurose branch office, Higashihiroshima, the current study was performed at Higashihiroshima City Hall, located at Saijo Sakae-Machi, in the Saijo area. This study assumes three groups of factors composed of multiple questions: (A) hardware, (B) software, and (C) service delivery at the City Hall, referring to Mansor and Razali (2010), who apply three similar groups of question items.

## Literature Review

Research publications that are closely related to the findings at the City Hall reported in this study, include Moteki (2020) and Moteki (2021). This section first discusses these outlines and how they relate to the results and implementations of the current study. Thereafter, it presents an overview of the customer satisfaction research in the public sector.

After distinguishing the differences in the administrative evaluation concept between Japan and the United States, Moteki (2020) analysed the results of a questionnaire survey of towns and villages in Japan that has been widely administered by Japanese local governments since the 1990s. The results indicated that there is a large difference in the implementation status between the larger city governments and the small municipalities, which face the challenge of a lack of resources, such as expertise and personnel because of fiscal constraints.

Moteki (2021) summarised the results of an online survey of visitors to the ward offices of Osaka, which was conducted to investigate the determinants of citizens' satisfaction with the offices of local governments. This study compares its results with a similar survey conducted in the Kurose branch office, Higashihiroshima, in August 2020. Unlike the survey in Kurose, which emphasised the importance of human factors, such as the response of staff, in Osaka, the service delivery factor had the strongest effect on the visitors' overall satisfaction with the counter service.

Customer satisfaction research in the public sector has referred to the accumulation of research on marketing by private corporations. Oliver and Winer's (1987) prominent study pioneered this research, focusing on the discrepancy between expectations and perceptions of performance afterwards as determining factors of customer satisfaction. Using their view as the foundation of analysis, Zeithaml

(1988) treated the intrinsic and extrinsic attributes as influential factors of perceived service quality (4). In this study, 'hardware' corresponds with Zeithaml's extrinsic attributes.

Later, in 2010, Oliver published his theories and perspectives on customer satisfaction in a book entitled *Satisfaction*, and Oliver (2015) updated the book's content in its second edition. Following Oliver's expectancy disconfirmation theory, many public administration studies considering citizens as customers have been published in academic journals (Van Ryzin 2004, 2006; Van Ryzin and Immerwahr 2007; Van Ryzin et al. 2004). Morgeson and Petrescu (2011) analysed citizen data on six federal government agencies and found that the factors that contribute to satisfaction and trust in government include perception of quality of service, information provided by the government, demographic factors, citizen expectations, and e-government adoption. Further, an empirical study by Morgeson (2012) added respondents' political ideology, party identification, and overall trust in the federal government as other factors determining citizen satisfaction. Kelly (2003) examined the relationship between overall customer satisfaction and fire and police services' performance in local public administration. Kelly and Swindell (2002) also examined the relationship between the indicators of actual programme performance and the overall customer satisfaction of local governments statistically.

The SERVQUAL model explained by Parasuraman, Zeithaml, and Berry (1988), following Oliver's theory, focuses on the exceptional gap between expectations and actual performance. This model had a strong influence on subsequent research on measures of service quality and customer satisfaction. Shortly after this study on SERVQUAL, other research was conducted on SERVQUAL, including Carman (1990), Reidenbach and Sandifer-Smallwood (1990), and Finn and Lamb (1991). Since then, many studies have continued to examine the five elements of factors influencing service quality. The identified components of SERVQUAL are tangibles, reliability, responsiveness, assurance, and empathy. Each element comprises multiple items. The 'tangibles' category of the model is equivalent to the hardware category in the current study. Assurance, empathy, and responsiveness—the multiple human factor-related elements—of the SERVQUAL scale are equivalent to the software category in this study. Wilson et al. (2021, 89–91) detailed the SERVQUAL model in the latest edition of *Services Marketing: Integrating Customer Focus Across the Firm*, a prominent textbook in the service marketing field. Among the studies on public administration, Wisniewski (2001) showed broad usage of the SERVQUAL-based model by Scottish Council services in the United Kingdom.

Customer satisfaction studies in the public sector after 2010 shifted toward examining the direct service experience. Studies on patient experience derived from patient satisfaction are an example in the medical field (Manary et al. 2013; Wolf et al. 2014). *The Patient Experience Journal*, specialising in this field, was launched in 2014. Further, the Japan Patient Experience Research Association developed a standardised questionnaire index on patient experience in the Japanese language, tailored for medical practice in Japanese hospitals. As for the private sector, one study discussed positive experiences and customer satisfaction in the Lithuanian hotel industry and applied the value co-creation-dialogue, access, risk assessment, transparency (DART) model in marketing research (Solakis et al. 2021). Solakis, Peña-Vinces, and Lopéz-Bonilla (2017) focused on the four aspects of DART in consumer behaviour in the

Greek hotel industry, which is the basis for the aforementioned study. Referring to these recent studies on customer experience in the public sector, including the medical field, the current study recognises that customers' direct experiences influence their overall satisfaction with counter services and that expectations are an important factor of customer satisfaction. A series of studies by the author intends to examine whether there are differences in the primal factors of customer satisfaction with government counter services in different environmental conditions using a simplified three-factor model.

In the public sector context, Wagenheim and Reurink's (1991) Figure 1 presents a conceptual diagram on the relationships among various elements from a customer service perspective in public administration. Specifically, the four elements involved in the government's efforts and perceptions related to customer satisfaction lead to satisfaction with internal and external customer service needs (customer service), which in turn creates organisational efficiency and effectiveness. Many studies following this model examined customer or citizen satisfaction in the public sector worldwide. Similar to the aforementioned private and healthcare sectors, research on satisfaction in the government sector, since 2010, has increasingly focused on the direct experience of users, including on-site surveys. This study applies the simplified framework of Mansor and Razali (2010), who conducted research in Malaysia using three question-item categories related to the determinative factors of customer satisfaction with the municipal government's counter service. To evaluate user satisfaction of public facilities, this study uses a three-group scale that is simpler than SERVQUAL's five-group scale. Agus, Barker, and Kandampully (2007) utilised a similar study concept in the Malaysian public sector. They conducted two different surveys targeting customers and managers in government branches and present the co-relationships among service quality dimensions, service performance, and customer satisfaction. Table 1 summarizes recent studies on user satisfaction with public facilities and services, focusing on user experience. Similar studies have been conducted in neighbouring countries in Southeast Asia. In Indonesia, Surapto (2014) conducted a survey targeting 200 residents from urban villages in South Tangerang. McMahon (2004) carried out a study on citizens' customer satisfaction with three local governments in Australia, implementing a mail-based survey among 1,500 residents in the city of Perth. Hsiao and Lin (2008) in Taiwan and Huque and Hayllar (1999) in Hong Kong conducted other prominent studies on customer satisfaction with government services in Asia. Akinboade, Kinfack, and Mokwena (2012) conducted a similar study in South Africa. As explained above, research on customer satisfaction in the field of public administration—sometimes referred to as citizen satisfaction—began in Europe and the United States and has spread to Asia and Africa.

[Table 1 here]

[Figure 1 here]

Considering the related studies conducted to date, this study draws implications for research on customer satisfaction by considering visitors' direct experience through an on-site survey held at a government building. Statistical examination of the survey results can reveal the possible determinants for counter services provided at branch offices of the municipal government.

## Research Methods

After research at the Kurose branch office and an Internet survey on the Osaka City Government in 2020, a self-administered on-site questionnaire survey was conducted in August 2021 at Higashihiroshima City Hall for citizens who visited and completed their business at this government facility.

### Kurose Branch Office, August 2020

For the questionnaire survey conducted at the Kurose branch office of Higashihiroshima in August 2020, Moteki (2022) provided a detailed description of the survey methodology. Customers of the Kurose branch office who completed their business received a four-page-long self-administered questionnaire. Researchers were waiting at the desks on the opposite side of the office counter. A total of 240 participants completed the questionnaires on the spot. The survey lasted for six business days (August 24–31, 2020). Based on the number of distributed flyers, the survey participation rate was approximately 60%. The questionnaire included items based on three concept groups, A–C, and a group of questions related to the dependent variable Y. This framework of the research design is similar to the design of the study at the City Hall presented in this article.

### Survey at Higashihiroshima City Hall, August 2021

A four-page self-administered questionnaire survey was conducted at Higashihiroshima City Hall for visitors who had completed their business. A4 size envelopes containing four pages long questionnaire were distributed to the city hall users, who filled them after leaving the city hall and returned them to the researcher in the enclosed stamped envelope. The survey took over four weekdays after we finished distributing the 1,000 copies we had prepared. Questionnaires were distributed at two places at the City Hall: the main entrance hall and the area around the side of the service entrance. The researcher and research assistants (third- and fourth-year students of the Public Administration seminar, Faculty of Law and one PhD student) waited in the office and guided visitors from the counter. There were six research assistants in total, with a maximum of three working simultaneously. The researcher and two research assistants were present at two places—the entrance hall and the area around the service entrance—at the City Hall and asked visitors to cooperate with the questionnaire survey of *Deleted for anonymity*, offering them a ballpoint pen, as a gift, pre-packaged in the A4 envelope containing the questionnaire. The service entrance, conveniently located to move toward the parking lot after running errands, is used by many

visitors to return home. The booths at the service entrance were operated during lunch breaks or when the survey collaborators took turns and had fewer personnel. At the two entrances to City Hall building, all users who have completed their errands were invited to participate in the survey, and those who agree were handed the questionnaires. All the prepared questionnaires were distributed by the afternoon of the fourth day.

The authors handed out (1) a letter requesting survey participation, explaining the cooperation agreement between the Higashihiroshima City Government and *Deleted for anonymity*, which were working together to create an international research centre in Higashihiroshima; (2) a questionnaire; (3) an envelope for returning the questionnaire; and (4) a ballpoint pen in a paper box, all sealed in an A4-sized paper envelope. Visitors who accepted the questionnaire filled out the form after returning home and mailed it to *Deleted for anonymity* with a pre-stamped envelope. The survey was conducted over four weekdays from Monday to Thursday, and 1,000 envelope sets were distributed to citizens visiting the office. A list of the questions is presented in Table 2. Figure 1 illustrates an analytical model with the question items for the explanatory variables classified into three groups. Table 3 presents the total number of copies distributed by day of the week, and Table 4 presents the total number of copies distributed by time slot in a day (excluding Thursday). The original research plan was to distribute the survey over five days from Monday to Friday, but distribution went smoothly, and the distribution of 1,000 copies finished a little after 1:00 p.m. on Thursday, August 26. During the period, Higashihiroshima was a target area for priority measures to prevent the spread of COVID-19 based on the Act on Special Measures concerning Influenza Pandemic (Novel Influenza or Re-Emerging Influenza). From Friday, the day after the actual survey period, Hiroshima Prefecture became an area subject to the declaration of a state of emergency as stipulated by the Act on Special Measures against Influenza Pandemic. As described below, the questionnaire also includes questions on measures to prevent the transmission of COVID-19 in the City Hall.

[Table 2 here]

[Table 3 here]

[Table 4 here]

The letter requesting survey participation included in the envelope detailed the scope and significance of the survey. The enclosed request letter included an explanation of the significance of the research and the agreement between Higashihiroshima city and *Deleted for anonymity* on the formation of an international research centre in Higashihiroshima. The letter also included the telephone number and e-mail address of the author as the principal investigator, so that the visitors could inquire about any points that they might have been unclear about.

To compare the results of the survey at the Kurose branch office and the survey of users at the ward office in Osaka, both in 2020, with the results of this survey, the part of the questionnaire regarding the

satisfaction level was left unchanged. Moreover, in the survey considered in this article, the three question items for the overall satisfaction of the dependent variable were convenience of the service, satisfaction with the experience, and others' recommendation of the service, based on similar surveys in the private sector. The first change made was to add a question on countermeasures against COVID-19 infections in the hardware of the government building (Group B) in response to a request from the City Hall. Next, in relation to the previous point, questions about lighting in the building and the non-smoking/smoking environment from the hardware group were removed. In addition, the question about 'time (shortness) to finish errands', which was included in group B in the previous survey, was moved to one of the question items of group C about service delivery (CQ2). CQ5, on the smoothness of service delivery, was also added in this survey. The other three questions in Group C are the same as those in the previous two surveys. In addition to the three groups of questions related to causal factors of customer satisfaction as well as question items corresponding to components of overall customer satisfaction, which are common to the 2020 survey at the Kurose branch office and the Internet survey for Osaka and have been surveyed continuously, questions on visitors' attributes, errands to be done at the office, and transportation access to the office were also included. In particular, questions about the *sogo madoguchi* (general counter), which has become a keyword for improving administrative counter services in Japan, were added. In Japanese public administration, the issue of *taraimawashii*, or the need to visit multiple counters instead of just one to complete errands, has often been pointed out as a major problem in bureaucratic work (*oyakusyo shigoto*). Saga City and Matsuyama City are experimenting with a general counter system that allows people to complete all procedures from the birth of a child to moving to a local government by simply visiting one counter. The reason that question 10 asked about the use of the general information desk (reception desk) and question 4 asked about the number of counters used before running errands is to examine the necessity of introducing the general counter approach mentioned above.

Figure 1 indicates the relationships assumed between customer satisfaction with the counter services at municipal offices based on the abovementioned questionnaire categories (A–C), the explanatory variables, and the items in group Y. Using the principal component analysis based on each category, scores of the first and second principal components of each group were circulated for the following regression analysis.

## Results

A total of 1,000 sets of questionnaires were distributed during the four-day survey period. Table 3 shows that the fewest questionnaires were distributed on Thursday, August 26, 2021, whereas the most were distributed on Monday, August 23. The distribution of the scheduled number of questionnaires was completed after 1:00 p.m. on August 26, a day earlier than planned. By September 27, 2021, 537 surveys had been collected, with a response rate of 53.7%. One of the questionnaires was largely incomplete and contained only attribute data. The rest of the questionnaires contained valid answers to many of the questions.

To avoid multicollinearity in the regression analysis, the author first summarised the explanatory variables into composite variables using principal component analysis for each group. The recent study by Davino et al. (2022) describes how to avoid multicollinearity in regression analysis using principal component analysis. Figure 2 depicts the results of the principal component analysis for questions in category Y. As a new column, the principal component scores for the first and second components were appended to the dataset as variables ZY1 and ZY2. Figure 2 also shows that YQ1 (Q8\_1), which is depicted at the top of the figure, had considerable effects on the second principal component –‘convenience and recommendation to others’—whereas the first component was interpreted as ‘experience satisfaction’.

Table 5 presents the correlation coefficients between the question items in groups A to C and ZY1 of Y category. Question items with correlation efficiencies higher than .40 were selected for use in the principal component analysis for each category. Figure 3 presents the principal component analysis results for the question items in category A. After this analysis, the dataset included the column of principal component scores for the first and second components of variables ZA1 and ZA2. We found that AQ6 (Q6\_6), related to COVID-19 infection prevention in the building, had significant effects on the second principal component. Regarding the first principal component, each question item shows the same directional characteristics. When checking details of the figure for AQ4 (Q6\_4) and AQ5 (Q6\_5), the clarity of the layout of the buildings on the site and locations of divisions inside the buildings are to the extreme right, strongly indicating the characteristics of the first principal component. Considering the relevant question items, we interpreted component 1 as ‘ease of finding building locations and understanding the divisions’ layout in the building’. We can then interpret component 2 as the ‘COVID-19 infection prevention measures in the building’.

[Table 5 here]

[Figure 2 here]

[Figure 3 here]

Similarly, principal component analysis was conducted for group B (Figure 4). Variables ZB1 and ZB2 calculated from the principal component analysis as the first and second components scores were included in this study. Figure 4 shows that BQ1 (Q6\_7) to BQ2 (Q6\_8) had greater effects on component 2 (ZB1). Further, BQ3 (Q6\_9) and BQ4 (Q6\_10) are related to ease of understanding explanations given by the officers. Component 1 was thus interpreted as ‘courteousness and responsiveness of the staff in charge’. Component 2 (ZB2) was interpreted as ‘ease of understanding explanations given by the officers’ if we focus on the contents of BQ3 (Q3\_9) and BQ4 (Q3\_10).

[Figure 4 here]

Similarly, Figure 5 presents the principal component analysis results for the question items in category C. New columns were created for variables ZC1 and ZC2 from the principal component scores for the first and second components. For the second principal component, CQ2 (Q7\_2) and CQ4 (Q7\_4) showed opposing characteristics. Further, CQ2 (Q7\_2) and CQ5 (Q7\_5), related to waiting time and processing time, were in the same direction. For the first principal component, CQ3 (Q7\_3), a question item about problem solving, is the most to the right. Component 1 is interpreted as 'solving the customer's problems and concerns'. Component 2 could be interpreted as 'waiting and processing time in the building' by focusing on the meaning of CQ3 (Q7\_3).

[Figure 5 here]

Using these variables, multiple regression analysis was conducted using the variable increase/decrease method in a stepwise approach, with ZY1 as the explained variable (Table 6). The synthetic variables used were ZA1, ZA2, ZB1, ZB2, ZC1, and ZC2, which were generated from the categories of explanatory question groups A–C. Table 6 indicates that the standardised partial regression coefficient in ZC1 was the highest at .40, significant at the 1% level. ZC1 was defined as 'solving customers' problems and concerns' and was the most important variable for explained variable ZY1. Following this variable, significant at the 1% level, ZB1 and ZA1 had positive effects on the objective variable, in that order. ZC2 was significant at the 5% level and had a negative coefficient. Focusing on the second principal component of the service delivery category, it was found that promptness of service delivery and short waiting time do not necessarily affect customer satisfaction positively. As each variance inflation factor was under 2.00, independence among the explanatory variables in the model was maintained.

[Table 6 here]

## Discussion

This study conducted at Higashihiroshima City Hall aimed to identify the determinants of customer satisfaction with counter service in the context of municipalities in Japan. Additionally, to reduce the researcher's burden of analysis and the respondents' burden of filling the form, we proposed a unique three-group scale, fewer than the five groups in SERVQUAL, and tested its usefulness through principal component regression analysis. Few studies have investigated user satisfaction and its determinative factors based on on-site survey focusing on users' direct experiences in public facilities. Although many

studies have made significant progress on satisfaction using expectancy disconfirmation theory, some of the SERVQUAL-based citizen satisfaction studies in the administrative field have merely been opinion surveys on policy areas in which respondents have no experience, and randomly selected residents are surveyed by postal mail method. The survey was conducted on four business days (23–26 August 2021), resulting in a total of 528 responses, with a response rate of 52.8%. The question items related to the regression analysis were categorised into three groups of explanatory questionnaire variables and one group of the explained variable of counter-service satisfaction at the City Hall. The three question items for overall satisfaction with the dependent variable are convenience of the service, satisfaction with the experience, and others' recommendation of the service, based on similar surveys in the private sector. There was also an open-ended question about opinions on general improvement in government services. The questionnaire included question items in four categories (A, B, C, and Y), constituting a simplified model compared with SERVQUAL's five-group categories for determinative factors. A two-stage analysis, the selective principal component regression analysis, was applied to the survey dataset. The regression analysis showed that the composite variable ZC1 of service delivery was the most important for the dependent variable ZY1, followed by groups B and A with an adjusted  $R^2$  value of .58. The  $\beta$  of ZC1 was .58. These results support the findings of a previous study conducted on Osaka city residents visiting ward offices (Moteki 2021).

There were differences among the results of the surveys conducted at the Kurose branch office, ward offices of Osaka, and Higashihiroshima City Hall. The latter two surveys' results indicated that service delivery of ZC1 was more important than that of ZB1 based on the principal component scores of counter staff responses or human-related factors. The differences between the results of the three studies may be due to differences in the services provided by the three types of government offices of these ordinance-designated cities: branch office, ward office, and the City Hall. Further, the differences between these government offices are linked to each visitor's attributes and characteristics. The coefficient of determination for the regression analysis on the scale of the three groups in this study is .58, which is considered appropriate in the social sciences. As in the 2020 questionnaire survey at the Kurose branch, at least one synthetic variable produced from each of the A-C question groups was statistically significant in the regression equation, and the results of this series of surveys confirm the usefulness of the author's proposed three-group user satisfaction survey scale. The author's 3-group scale is less than SERVQUAL's 5-group scale, examines only the value of perceived performance without using the value of the difference between expected and perceived performance. It also eases the respondent's burden in responding and reduces the data processing burden for analysts, including practitioners. This study's validation of a simple 3-group survey scale for public facility user satisfaction provides useful insights for local government practitioners seeking to conduct similar satisfaction surveys, and offers methodological suggestions for researchers examining service satisfaction in public and private service organizations.

## Conclusion

This study has examined citizens' direct experience of counter services through an on-site survey held with visitors of a municipal government building. The regression analysis revealed that service delivery, human factors, and hardware aspects are important, in that order, concerning customer satisfaction with the services of the City Hall. The service-delivery-related component, ZC1, was more important than the hardware of the building (tangibles in SERVQUAL) and human-related factors. Regarding the second principal component of service delivery, the results showed that promptness of service delivery and short waiting time do not necessarily affect customer satisfaction positively. Among studies in the healthcare field, which is close to the field of government, some show that waiting time in hospitals has an effect, especially a negative effect, on patient satisfaction (Alrasheedi et al. 2019). By contrast, previous studies have shown that it is not the waiting time itself—or 'objective waiting time'—that affects patient satisfaction but the way the patient waits or their 'waiting environment' (Pruyn and Smidts 1998). Pruyn and Smidts (1998) also examined the influence of the waiting room's attractiveness and presence of television. The first floor of Higashihiroshima City Hall, the government office examined in this study, has LCDs in front of the waiting chairs. This type of waiting environment is a subject for future research by the author.

The authors would like to explore models and questionnaires that can better grasp customer satisfaction at government offices by conducting a follow-up survey in the same Kurose branch office in the future. The results of these three surveys up to 2021 could be compared with those of future research to examine the effect of different characteristics of government organisations on the determinants of customer satisfaction. Further research can not only help examine the order of importance among the three groups of questionnaire items, which is an academic analysis, but also identify the items of importance within each question group. The results can provide feedback to the local governments that cooperated in the implementation of the survey studies with suggestions that will lead to improvement of specific administrative tasks.

## Declarations

### Biographical note

**Yasutoshi Moteki** (PhD) is an associate professor of public administration at Hiroshima University's Faculty of Law and the School of Humanities and Social Sciences. His current research interest lies in public management, budgetary process, and policy evaluations. He has also been conducting empirical research on customer or citizen satisfaction in the field of public administration. He received his Bachelor of Law, Master of Laws, and PhD degree from Kyushu University. His work has appeared in prominent scholarly journals both in Japan and abroad. He served on the Board of Directors of the Nippon Urban Management and Local Government Research Association from 2015 to 2018.

### Declaration of conflicting interests

The author declares no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## Data availability statement

The datasets generated and/or analyzed during the current study are not publicly available due to the data anonymity guarantee given to the City Hall. The aggregated statistics of each question items are available from the corresponding author on reasonable request.

## Ethical approval

This study is not biomedical research directly covered by the Declaration of Helsinki and has not undergone ethical review at our institution. The survey is within the scope of a normal social survey, and the question items in the questionnaire are not invasive. However, referring to the three principles outlined in the Declaration, we prepared a survey implementation plan and questionnaire which were confirmed by the divisions in charge at the City Hall, who did so from the perspective of the citizens (the study subjects). In addition, before preparing the research plan, the detailed research design was reviewed by the council's review committee for funding, which included government practitioners, to evaluate the appropriateness of the overall design.

## Informed consent

For the on-site survey, the name of the survey and the entity conducting the survey were displayed on posters at two locations in the booth, and questionnaires were distributed to willing City Hall users. In addition, the enclosed request letter clearly states (1) the purpose of the survey, (2) that the responses are voluntary and aggregate results will be used only for academic purposes, (3) the name of the organisation conducting the survey, person in charge, address, contact telephone number, and e-mail address, and (4) the procedures to be followed if participants wished to receive the survey results. Moreover, the abovementioned points (1) and (2) are clearly stated again at the beginning of the questionnaire, along with the name of the organisation conducting the survey. It also explains that the results of individual responses will not be shared with the City Hall and participants will not be inconvenienced because of the content of their responses. No independent written consent forms were provided and questionnaires were distributed only at the survey booth. The responses were filled out away from City Hall and mailed using the enclosed stamped return envelopes. The abovementioned measures ensured that participation was voluntary.

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## Tables

Table 1. Recent studies on user satisfaction with public facilities or public services

	Author(s) (Year of Publication)	Type of facility, region/country	Details
1	Agus, Barker, and Kandampully (2007)	86 branches of Ministries, Malaysia	They conducted two different surveys targeting customers and managers in government branches.
2	Hsiao and Lin (2008)	A local government Revenue Service Office (GRSO), Taiwan	The authors used their own scale for administrative agencies called the COSES model (customer-oriented service-enhancement system). It is a five-group scale for measuring the staff's customer orientation of organizations.
3	Mansor and Razali (2010)	Malaysia	They conducted research in Malaysia using three question-item categories related to the determinative factors of customer satisfaction with the municipal government's counter service. To evaluate user satisfaction of public facilities, this study uses a three-group scale that is simpler than SERVQUAL's five-group scale.
4	Akinboade, Kinfack, and Mokwena (2012)	The Sedibeng district municipality, South Africa.	Structured sample of 1,000 residents of Lesedi, Emfuleni and Midvaal municipalities were analysed. Their study revealed differences in satisfaction and dissatisfaction in each policy area.
5	Surapto (2014)	South Tangerang, Indonesia	The researcher conducted a survey targeting 200 residents from urban villages.
6	Józsa (2017).	Hungary	The research used 60 question items on a 5-point Likert scale concerning market orientation in municipal services and that market orientation plays

			an important role because of positively influencing customer satisfaction. A total of 1580 municipal service providers were surveyed.
7	Romano & Masserini (2020).	Italy	A total of 485 students enrolled at the University of Pisa were surveyed. The researchers examined whether users' perception of water quality differ based on difference in supplier's organizational features, publicly or privately owned.

Table 2. Outline of the survey question items related to customer satisfaction

Concept Groups	Question Items
A) Office hardware (buildings, tables, chairs, lighting, and others)	<p>AQ1 (Q6_1) Location (access from home)</p> <p>AQ2 (Q6_2) Tables and chairs in the building</p> <p>AQ3 (Q6_3) Indoor atmosphere</p> <p>AQ4 (Q6_4) Ease of understanding the layout of the floors and offices inside the building</p> <p>AQ5 (Q6_5) Ease of understanding the buildings' locations and entrances at the site of the City Hall</p> <p>AQ6 (Q6_6) Countermeasures against COVID-19 infection in buildings (partitions, sanitisers at entrances, etc.)</p>
B) Software (staff responses)	<p>BQ1 (Q6_7) Courteousness of the staff in charge</p> <p>BQ2 (Q6_8) Ease of consultation and asking the staff in charge questions</p> <p>BQ3 (Q6_9) Ease of understanding oral explanations from the officer in charge (speed)</p> <p>BQ4 (Q6_10) Clarity of explanation given by the officer in charge (content)</p>
C) Service delivery	<p>CQ1 (Q7_1) Planned business in the City Hall was completed after this visit</p> <p>CQ2 (Q7_2) Length of time to complete customer requests is short</p> <p>CQ3 (Q7_3) The problem was solved after this visit to the City Hall</p> <p>CQ4 (Q7_4) The worries and concerns of customers were alleviated after this visit to the City Hall</p> <p>CQ5 (Q7_5) This time, I was able to run my errands at the City Hall more smoothly than expected</p>
Y) Degree of customer	YQ1 (Q8_1) Satisfaction with the experience at the

satisfaction with counter services at the City Hall	City Hall this time
	YQ2 (Q8_2) I want to tell people about this experience at the City Hall and how good it was
	YQ3 (Q8_3) The administrative services provided by the City Hall are convenient

Table 3. Number of questionnaires distributed (August 2021)

Day of the Month	Weekday	Count	Ratio
23	Monday	382	38.2%
24	Tuesday	229	22.9%
25	Wednesday	277	27.7%
26	Thursday	101	10.1%
Distribution date unknown		11	1.1%
Total		1,000	100.0%

Note: Thursday's distribution ended at about 1:05 p.m.

Table 4. Number of questionnaires distributed in each time slot (August 2021)

8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 p.m.	13 p.m.	14 p.m.	15 p.m.	16 p.m.	17 p.m.	Monday through Wednesday
25 2.8%	67 7.5%	129 14.5%	131 14.8%	106 11.9%	102 11.5%	160 18.0%	118 13.3%	44 5.0%	6 0.7%	888 100.0%

Table 5. Co-relationship between component ZY1 and the question items

<b>Question Items</b>	<b>r</b>
AQ1 (Q6_1)	0.234**
AQ2 (Q6_2)	0.375**
AQ3 (Q6_3) *	0.494**
AQ4 (Q6_4) *	0.463**
AQ5 (Q6_5) *	0.453**
AQ6 (Q6_6) *	0.455**
BQ1 (Q6_7) *	0.615**
BQ2 (Q6_8) *	0.602**
BQ3 (Q6_9) *	0.613**
BQ4 (Q6_10) *	0.609**
CQ1 (Q7_1) *	0.458**
CQ2 (Q7_2) *	0.419**
CQ3 (Q7_3) *	0.502**
CQ4 (Q7_4) *	0.628**
CQ5 (Q7_5) *	0.589**

Note: Questionnaire items with correlation coefficients of 0.4 or higher have a single asterisk. These questions were used in the principal component analysis for each category.

\*\*  $p < .01$

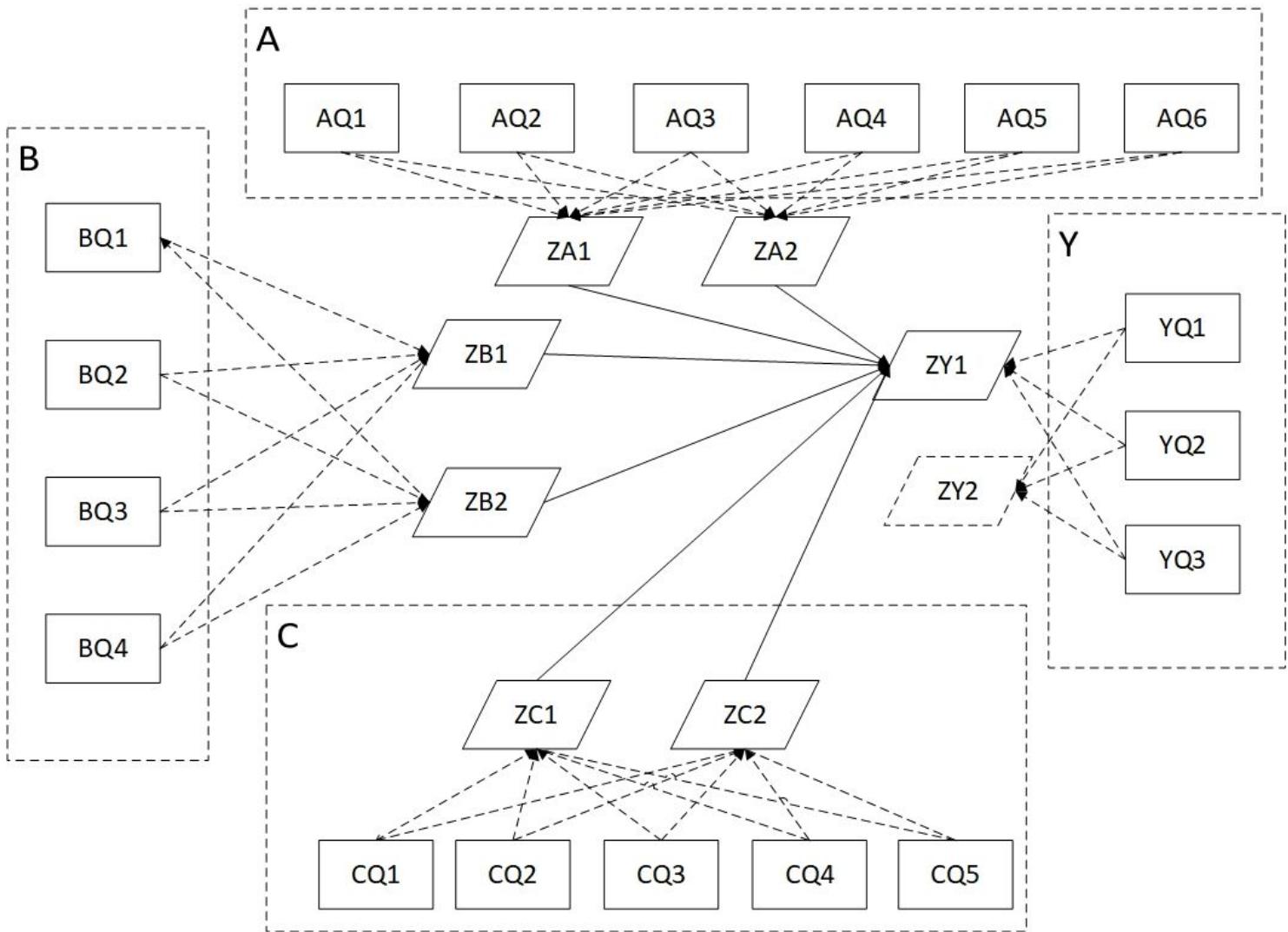
Table 6. Multiple regression predicting the overall customer satisfaction (component ZY1)

	<b>Zero Order r</b>	<b><math>\beta</math></b>	<b>p</b>	<b>VIF</b>
ZA1	.540**	0.24**	< .0001	1.49
ZB1	.650**	0.28**	< .0001	1.96
ZC1	.641**	0.40**	< .0001	1.50
ZC2	-.073	-0.06*	.0383	1.00

Note:  $R^2 = .58$ ; Adjusted  $R^2 = .58$ ; VIF = variance inflation factor.

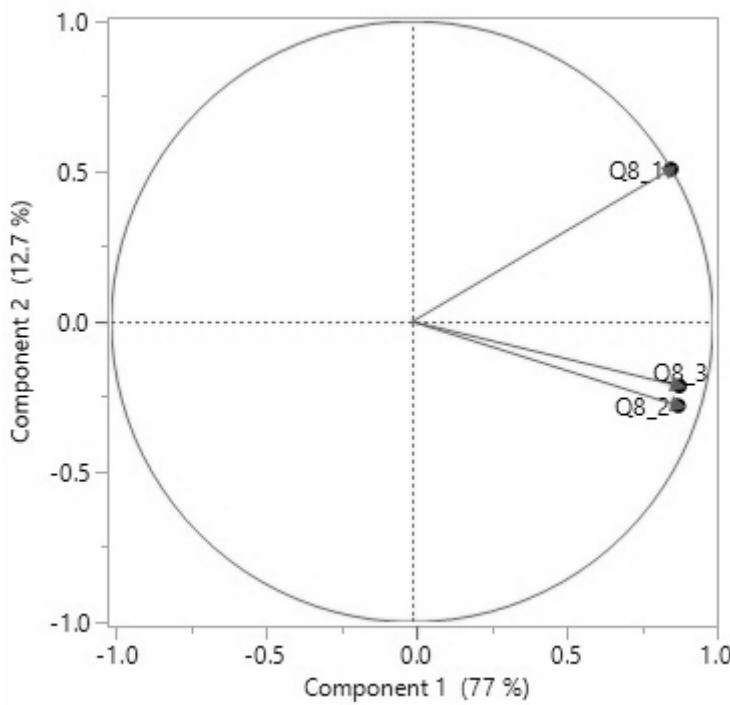
\*\*  $p < .01$  \*  $p < .05$

# Figures



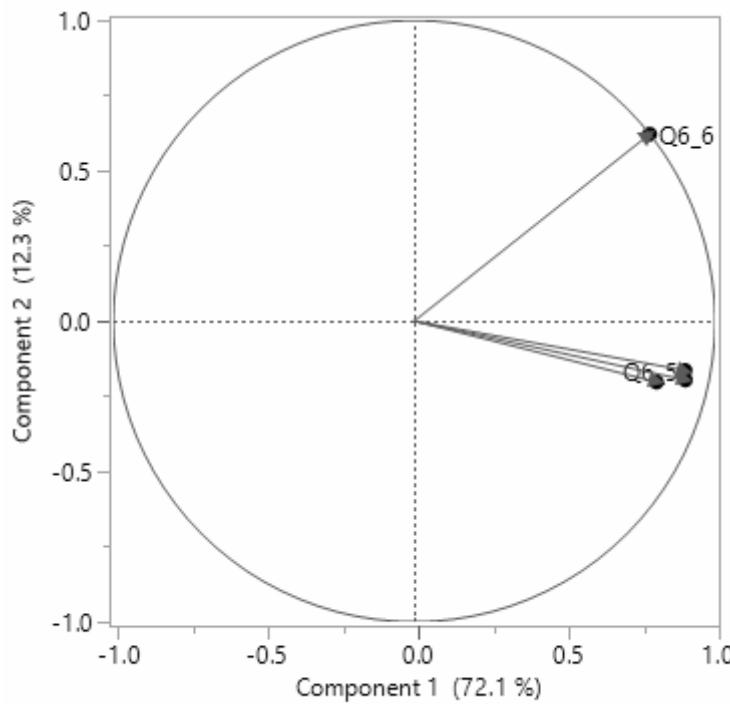
**Figure 1**

Research analysis model



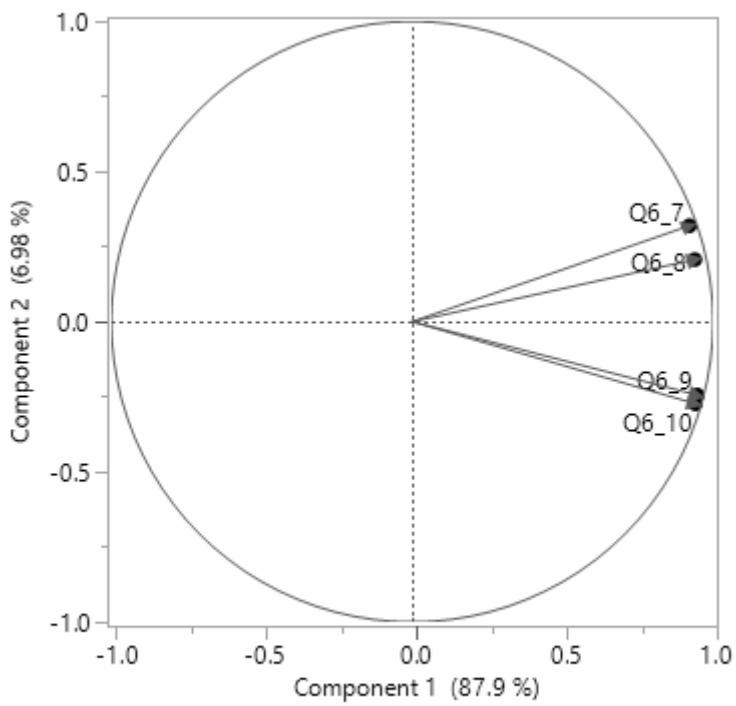
**Figure 2**

Factor loadings related to Y (overall customer satisfaction with counter services)



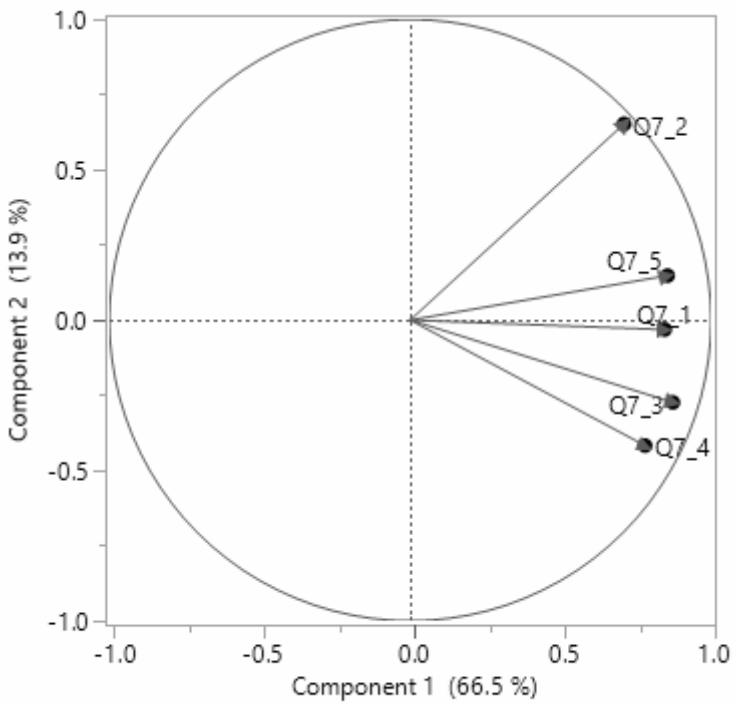
**Figure 3**

Factor loadings related to A



**Figure 4**

Factor loadings related to B



**Figure 5**

## Factor loadings related to C