



Quality of life in cities: An outcome and a resource?

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ABSTRACT

This study contributes to the improvement of the knowledge about quality of life (QoL) in cities, deepening not only in its antecedents, but also in its outcomes, under the theoretical approach of the resource-based view. On the one hand, we hypothesize that QoL in a city can be driven by governance resources such as transparency and reputation; on the other hand, we propose that QoL can be seen as a strategic resource leading to a higher city competitiveness, which in turn can act as an inducer of a higher smart city index. The latter relationship could be explained as a positive resource spiral in cities, relying on resource conservation theory. Our study also provides favorable evidence for these theoretical relationships set out in a structural equation model with a sample of Spanish Smart cities.

1. Introduction

In today's world, cities host more than 50% of the population, a percentage that will continue to increase over the coming decades. According to [United Nations \(2022\)](#) forecasts, this percentage will reach 68% in 2050. This growing importance of the role of cities has drawn the attention of both public authorities and the academic world to issues such as the governance of urban spaces, QoL and the competitiveness of cities ([De Guimarães et al., 2020](#); [Glaeser, 2011](#); [Goerlich & Reig, 2021](#); [Iglesias-Antelo et al., 2021](#); [Wang & Zhou, 2023](#)). As pointed out by [Goerlich and Reig \(2021\)](#), nowadays the governance of urban spaces goes beyond the improvement of infrastructure and connectivity of cities but is aimed at improving the QoL –concept that refers to “positive settings that result in citizens’ cognitive, subjective, and affective well-being” ([Iglesias-Antelo et al., 2021](#)). However, while the impact of good governance has been widely analyzed at the country level, research at the local level is still scarce ([Cárcaba et al., 2022](#)). Moreover, the few studies that have analyzed how the quality of governance influences QoL have obtained mixed results. Thus, for example, while [De Guimarães et al. \(2020\)](#) and [Iglesias-Antelo et al. \(2021\)](#) have positioned transparency as a governance resource with important influence on QoL, other scholars found no relationship ([Cárcaba et al., 2022](#); [Cárcaba, González, Ventura, et al., 2017](#)). In this sense, one of the objectives of

this research is to provide new evidence of the effect of two variables related to the quality of governance (transparency and reputation) on QoL.

Another concept on the rise in the last decade is the smart city ([Caragliu & Del Bo, 2019](#); [Chang & Smith, 2023](#)). Although initially linked to the development of information and communication technologies, it is now a concept closely linked to that of QoL ([De Guimarães et al., 2020](#)). In fact, it has been argued that improving QoL should be one of the main objectives of smart cities ([Chang & Smith, 2023](#); [Chen & Chan, 2023](#)). Smart cities, through the improvement of infrastructures and services to citizens, offer them better alternatives to satisfy their needs and solve their problems, and, consequently, improve their QoL ([Chen & Chan, 2023](#)). While this association seems logical, we wonder about the inverse relationship; that is, can QoL in a city promote the development of a smart city?

In short, this study contributes to the improvement of the knowledge about QoL in cities, deepening not only in its antecedents, but also in its outcomes, under a new approach based on the resource-based view (RBV). From this perspective ([Carvalho et al., 2018](#); [Wernerfelt, 1984](#)), QoL can be viewed as an outcome and as a strategic resource as well. As an outcome, because governance resources (transparency and reputation) determine QoL ([Iglesias-Antelo et al., 2021](#)). As a strategic resource, QoL can lead to higher competitiveness. According to [Morais](#)

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and Camanho (2011), cities are constantly in competition for investment and qualified human resources. In this sense, cities with higher QoL can be expected to be more attractive to citizens and markets (Shapiro, 2006) and, consequently, improve their competitiveness (Sgambati & Gargiulo, 2022). Additionally, we hypothesize that a higher competitiveness can also drive a higher smart city index; perhaps by the generation of a spiral of positive resources, since cities with a higher competitiveness index may more easily obtain new resources to invest in actions and policies leading eventually to rise their smart city indexes.

This work is structured as follows. In Section 2, the different variables/concepts involved in the study are theoretically reviewed: transparency and reputation (governance resources), QoL, city competitiveness and smart cities. Section 3 presents the proposed theoretical model and justification of the hypotheses on which it is based. Section 4 provides the methodological aspects of the empirical study carried out. The hypothesized relationships are tested through a structural equation model with a sample of Spanish smart cities. As will be seen, this has required observations of the different variables referring to non-contemporaneous dates in order to test the successive theoretical causes and effects. Section 5 contains the results and discussion. And Section 6 presents conclusions, limitations and future lines research.

2. Theoretical concepts

2.1. Governance

The governance of cities has been a topic of growing interest, both from theoretical and empirical research (Cárcaba, González, & Ventura, 2017; Hartley, 2023). More specifically, there is a trend in the literature trying to disentangle between governance and e-governance (Bannister & Connolly, 2012), studying the relationships between smart governance and sustainability (Giuliodori et al., 2023) or the smart governance in smart cities (Bolívar & Meijer, 2016). Furthermore, smart governance can be associated with economic welfare and the enhancement of QoL in cities (Giuliodori et al., 2023).

The concept of governance has also been associated with transparency and reputation (Cárcaba, González, Ventura, et al., 2017; De Guimarães et al., 2020; Iglesias-Antelo et al., 2021). These are the two governance resources that are considered in this research.

There is not a unique definition of the concept of transparency due to its multifaceted nature, and all attempts to date have focused on the availability of information by administrations. In general, transparency is defined as the quality of a government, a firm, an organization, or a person to be open regarding the disclosure of information, actions, or plans. Moreover, focusing on public institutions' transparency, the concept becomes narrower. It is defined as the increased flow of timely and reliable economic, social, and political information, which is accessible to all relevant stakeholders (Kaufmann & Kraay, 2002). For other scholars, transparency has a three-dimensional character: government openness, whistleblower protection and publicity (Bauhr & Grimes, 2012).

Some researchers make a connection between transparency and performance in the definition (Meijer, 2013). Other scholars see transparency as a mechanism to mitigate corruption (Vian, 2020), relate it directly to openness, lack of opacity, integrity, and incorruptibility (Kim & Lee, 2019) or as a preventive element against abuse of power in democratic governments (Ferry & Murphy, 2018). Transparency can be seen as a democratic value that seeks to pursue trust and accountability in government (Androniceanu, 2021; Kim & Lee, 2012) or link its absence to a decrease in citizens' trust (da Cruz et al., 2016). On the other hand, the technological dimension has become so important in recent decades that it has become inseparable from the very concept of transparency. The emergence and consolidation of e-government, together with the explosion of big data and the generation and processing of massive data, multiply the possibilities for improving

administrative transparency (Medir Tejado et al., 2021).

In public administration, reputation and governance are complexly linked, with reputation representing a key role in determining organizational behaviour, stakeholder relationships, and overall performance in the public space (Bustos, 2021). The idea that reputation plays a central role in local governance is not new (Ryan, 2007) as, for example, influences how organizations are perceived by stakeholders (Y. Zhao et al., 2023). Moreover, brand reputation is crucial in a space where regions and cities insistently compete for investment from private and public actors (Middleton, 2011).

In terms of reputation measurement, some scholars suggest that the drivers of city reputation are government performance, local government communication strategy, and citizens' perceptions-expectations about the city (Sanders & Canel, 2015). On the other hand, city reputation can nurture city sustainability (Pérez-Cornejo et al., 2023) and has complex links with city performance (Delgado García & De Quevedo Puente, 2016). Moreover, when quantifying the antecedents and consequences of organizational reputation, there are highly sensitive variables that moderate the effects, such as country, stakeholder group and reputation measure (Ali et al., 2015). Additionally, in reputed cities there is a positive relationship among cultural participation and attractiveness, and tourism intensity and reputation (Pavković et al., 2021).

2.2. Quality of life

QoL seems to be a multidimensional concept (Lambiri et al., 2007), a vague, ambiguous, and difficult to define concept, widely used, but with little consistency (Galloway, 2009), an obscure concept (Barcaccia et al., 2013), a multi-level and amorphous concept (Brown et al., 2004), a complex concept (MacKū et al., 2020), or an umbrella term (Costa et al., 2021). Despite this lack of consensus in terms of conceptualization, QoL has been a strong concern for multiple territorial stakeholders (or units of analysis); among others, countries (Bérenger & Verdier-Chouchane, 2007), regions (Dardha & Rogge, 2020; Martín & Viñán, 2017) and cities (Chang & Smith, 2023; Peach & Petach, 2016).

At the same time, key international institutions like the European Commission with the Flash Eurobarometer 366 (Weziak-Białowolska, 2016), the Organization for Economic Co-operation and Development with the Better Life Index (Peiró-Palomino & Picazo-Tadeo, 2018), or the United Nations with the Human Development Index (Kalimeris et al., 2020), are making intense efforts to promote its study and measurement.

In terms of measurement, the debate is also intense, considering QoL a dynamic, difficult to measure, complex and dispersed concept (Somarriba Arechavala & Zarzosa Espina, 2016). The approaches to QoL measurement have a duality: objective versus subjective indicators (MacKū et al., 2020). The objective approach uses indicators based on objective, quantitative values collected during statistical surveys or derived from other socio-economic or spatial data (Kuentz-Simonet et al., 2023). The greatest strength of this group of indicators lies precisely in their objectivity. In contrast, the subjective framework relies on public opinion surveys about how people feel about their lives, their psychological state of satisfaction (Kubiszewski et al., 2018). QoL research combining objective and subjective measurements are not new (Cummins et al., 2003).

The measurement of QoL has been carried out from different spatial dimensions. Some scholars have done a comparative analysis of QoL among different countries in the same geographical area; for example, in Europe (Ivaldi et al., 2016; MacKū et al., 2020; Rogge & van Nijperseel, 2019). On the other hand, other stream of research is concerned with the comparative study of QoL among cities in the same country (Kaklauskas et al., 2018). The municipal level, as a unit of analysis, has not received as much attention as countries and individuals have, due to the fact that local information about the different dimensions of QoL is difficult to find for most cities within Europe (González et al., 2018). There is also a concern for smaller geographical spaces, sub-populations, represented

by municipalities or other local government areas, and there are even studies that focus on the determinants of individual subjective well-being (Goerlich & Reig, 2021; Iglesias-Antelo et al., 2021; Land & Michalos, 2018). Additionally, the QoL measurement of rural versus urban environments is also taking place (Ma et al., 2020).

2.3. City competitiveness

On the roots of strategic management literature, trying to identify the resources that make some firms more competitive (profitable) than their rivals has been a key topic for a long period (Barney, 1986; Collis & Montgomery, 2008; Rindova & Fombrun, 1999). This competitiveness concern has not only been studied in the private-for-profit organizations domain. For public organizations there is a rising consensus that competition is growing among cities throughout national boundaries in the globalized economies (Jensen-Butler, 1999; Szymaniec-Mlicka, 2014). Since the 1990s, several key events have influenced the scientific debate on territorial competitiveness; among others, globalization, economic crises, the growth of urban economy, environmental challenges and technological changes (Sgambati & Gargiulo, 2022).

The measurement of city competitiveness is also researched in multiple disciplines (Sgambati & Gargiulo, 2022). Urban competitiveness measurement involves several dimensions and indicators, like economic, social, environmental, infrastructure and connectivity, innovation and knowledge (Kurek et al., 2022). There is also a holistic approach to create urban competitiveness indexes and rankings, representing several dimensions (Sáez & Perriñez, 2015). The research of city competitiveness measurement, in terms of the territory covered, ranges from rankings of global cities (Ichikawa et al., 2017) or studies in Europe (Sáez & Perriñez, 2015), to the study of city competitiveness in one country; for example, in China (So & Shen, 2004), Australia (Hu, 2015), or Spain (Somoza Medina, 2016).

2.4. Smart cities

The topic of smart cities has gained traction as a response to several urbanization challenges (Braga et al., 2021), not only for scholars but also for planners and policy makers (Chang & Smith, 2023; F. Zhao et al., 2021). The concept of smart cities is complex (Glasmeyer & Christopherson, 2015), a fuzzy concept (Albino et al., 2015; Nam & Pardo, 2011), sometimes identified with intelligent city or digital city (Secinaro et al., 2022), with an urban labelling (Hollands, 2008), and moves into different fields and theoretical perspectives (Secinaro et al., 2022). This gives rise to research of an interdisciplinary, multidisciplinary, and multivariate nature (Angelidou, 2015; F. Zhao et al., 2021).

The different definitions of smart cities focus on three main components: physical infrastructure (Giffinger et al., 2007; Hajduk, 2016), quality of life (Giffinger et al., 2007), and innovation ecosystems (Camboim et al., 2019; Giffinger et al., 2007; Hajduk, 2016; Sorri et al., 2024). From this point of view, one of the main objectives of smart cities, with the help of Information and Communication Technologies (ICTs), is to improve sustainability (Ahvenniemi et al., 2017; Giffinger et al., 2007; Hollands, 2008; Nam & Pardo, 2011), quality of life (Marsal-Llacuna et al., 2015), achieve prosperity, effectiveness and competitiveness (Angelidou, 2015) and improve cities' performance. It, therefore, requires the combination of tangible resources, such as infrastructure, and intangible resources, such as human capital and knowledge capital (Keshavarzi et al., 2021), addressing both objective and subjective aspects of quality of life (Capdevila & Zarlenga, 2015; Macke et al., 2018). To sum up, Myeong et al. (2022) define smart city as a sustainable city that solves urban problems and improves citizens' QoL through the fourth industrial revolution technology and governance between stakeholders.

There are many benefits associated with smart cities: sustainable economic growth, socioeconomic, ecological and urban competitive advantage, more resilience, tolerance and prosperity (Eremia et al.,

2017), and better public services. They encourage innovative business, optimize urban infrastructure and preserve environment (Marsal-Llacuna et al., 2015), attract more qualified human capital and generate greater business dynamism (Lee et al., 2014), improve the infrastructure, the transport and security system, and city's image and pride (Chang & Smith, 2023). However, we cannot ignore the disadvantages associated with the incorporation of smart technologies: system information insecurity, personal privacy leakage, information islands and digital divide (F. Zhao et al., 2021).

The scientific discipline has established that the main domains used to measure how smart a city is are the following (Chang & Smith, 2023): smart economy, smart governance, smart environment, smart people, smart living, and smart mobility. Each of them uses different indicators that allow us to establish a ranking of smart cities.

Current trends in urban research tell us about digital city, green city, and knowledge city (Lombardi & Vanolo, 2015). Similarly, the new directions of smart city development are smart parking, smart buildings, smart energies, smart utilities, and smart grids (Eremia et al., 2017). A smart grid can be presented as an infrastructure within a sustainable city (Myeong et al., 2022). However, we should not confuse smart with sustainable. A city must be sustainable to be smart, but the inverse relationship is not always the case (Ahvenniemi et al., 2017).

3. Hypotheses and proposed theoretical model

The transparency of public administrations is essential for the trust of citizens. According to Cárcaba et al. (2017), "transparency adds clarity and accountability to public administration, which otherwise is prone to corruption". Transparency is also essential to promote citizen participation in decision making, since without transparency citizens would not have the necessary information for this action (Cárcaba, González, Ventura, et al., 2017; De Guimarães et al., 2020). Likewise, as pointed out by De Guimarães et al. (2020), transparency "makes efficiency and effectiveness in city governance possible, resulting in satisfactory service delivery", which will positively impact the citizen's QoL. In the study conducted by De Guimarães et al. (2020), on a sample of 829 inhabitants of a city in northeastern Brazil, it was shown that the governance resource with the greatest influence on QoL was transparency.

Based on the above premises and evidence, the following hypothesis is formulated:

H₁. Higher local government transparency has a positive impact on city QoL.

On the basis of the RBV theory (Wernerfelt, 1984), reputation has been positioned as a key strategic resource for the achievement of a competitive advantage in the for-profit domain. In the public sphere, although the evidence is much less (Delgado García & De Quevedo Puente, 2016), there is some proof of the positive effect of reputation on the performance of cities. In a sample of 263 local authorities in Israel, Carmeli and Cohen (2001) demonstrated the influence of reputation on the financial performance of these entities. On the same sample, Carmeli and Tishler (2004) found that organizational culture and perception of reputation were the resources that most influenced the performance of the entities (measured in terms of self-income ratio, collecting efficiency ratio, employment rate, and municipal development). Moreover, Iglesias-Antelo et al. (2021), corroborated the relationship between city reputation and QoL of cities.

Based on the proposed RBV theory and previous evidence, the following hypothesis is proposed:

H₂. Higher major reputation has a positive impact on city QoL.

The relationship between QoL and performance is a topic of interest in various fields, including economics and urban studies and the research has shown that QoL factors can have a significant impact on

various aspects of performance, such as economic growth, productivity, and overall well-being (Lambiri et al., 2007). Moreover, in recent years there has been an increasing emphasis on linking QoL to the competitiveness of cities (Sáez et al., 2017). QoL in urban spaces plays a fundamental role in attracting investment and qualified people (Florida, 2002; Lambiri et al., 2007; Shapiro, 2006). According to Sgambati and Gargiulo (2022) "cities and territories with a high concentration of skilled and creative people may enhance competitive advantage, encouraging urban and economic growth".

Based on the above ideas, the following hypothesis is proposed:

H₃. Higher city QoL has a positive impact on city competitiveness.

In the domain of smart cities literature, the research that deeps into the relationships between performance and smart cities is growing (Albino et al., 2015; Kutty et al., 2022). Despite this, we are unaware of the existence of studies linking the city's competitiveness with its smart city index. The application of resource conservation theory (Hobfoll, 1989, 2001) to cities suggests that cities with more resources are in a better position to obtain new resources than those with fewer resources. In this sense, it is to be expected that cities with a greater competitive advantage will have more environmental, economic and human resources to maintain and improve their infrastructure, the QoL of their inhabitants and innovation. Thus, for example, human capital enables the improvement of technological advances and innovation (Sgambati & Gargiulo, 2022) which is key to the implantation of smart cities. Also, in a research in UK smart cities, it is stated that city competitiveness could be a driver for smart city innovation by nurturing a technological environment and urban development (Taylor Buck & While, 2017).

Based on the above premises and evidence, the following hypothesis is formulated:

H₄. Higher city competitiveness has a positive impact on the smart city index.

These four hypotheses make up our proposed theoretical model, which is shown in Fig. 1.

4. Methodology

4.1. Data and sample

In order to test the relationships of the theoretical model, data were collected from five secondary sources of information. Next, the variables and databases that have been used are briefly described. Section 4.2 provides information on measurement scales and Annex A includes further detail of the created latent variables (TRANSPARENCY, MAJOR REPUTATION, QUALITY OF LIFE, CITY COMPETITIVENESS, SMART CITY) and their components.

The first governance variable, the construct Transparency (TRANSPARENCY), was obtained from a study of transparency of local governments in 100 Spanish cities carried out by Transparency International Spain¹ for the year 2010. Major Reputation (MAJOR REPUTATION), the second governance variable, came from Merco,² which analyses the reputation of the majors of 81 Spanish cities for the year 2010. As for the variable QoL (QUALITY OF LIFE), data for the year 2019 were obtained from the research by Goerlich and Reig (2021) with a sample of 73 cities. The Competitiveness of the City in 2020 (CITY COMPETITIVENESS) came from the Global Competitiveness Index with data created by IDDIGO³ for a sample of 116 cities. In the same vein, the

variable Smart Cities 2023 (SMART CITY) was obtained from the Smart Global Index created by IDDIGO⁴ for a sample of 50 cities. As a consequence of the use of these five data sources, the complete final sample is composed of just these 50 cities, which have in common being the capitals of the 50 Spanish provinces. However, we can consider that this is a sufficiently representative sample of Spanish cities, since they differ greatly in size, as can be seen in Annex B.

4.2. Measurement scales

The only observable variable used in the model is Major Reputation (MAJOR REPUTATION) and it has been proxied by the response to a question posed by a Merco survey: "could you rate the major of your city globally?", measured on a scale ranging from 0 to 1.

The remaining variables are latent, and they have been constructed through principal component analysis. First, the Transparency strategic resource (TRANSPARENCY) was derived from the other five latent variables measured by Transparency International Spain: information about the municipal corporation, relations with citizens and society, economic and financial transparency, transparency in public service contracts, and transparency about urban development and public works. As can be seen in Annex C, the factor loadings in this analysis are practically higher than 0.800, jointly accounting for 69.84% of the cumulative variance. The measures of sampling adequacy indicate that the correlation matrix for the scale is adequate: Bartlett's test of sphericity with $\chi^2 = 199.963$, degrees of freedom = 10, and p-value < 0.001, and the high KMO (Kaiser-Meyer-Olkin) value of 0.853 are indicators of a strong partial correlation among items.

Second, the construct Quality of Life (QUALITY OF LIFE) arises from other three latent variables: socioeconomic performance, general liveability conditions and residents' status. Similarly to the previous case, and as seen in Annex D, the factor loadings are around 0.800, and the extracted factor accounts for 67.53% of the variance. Both measures of the Bartlett's test of sphericity with $\chi^2 = 45.437$, degrees of freedom = 3, and p-value < 0.001, and the KMO value of 0.623 are indicators of sampling adequacy.

Third, the City Competitiveness factor (CITY COMPETITIVENESS) is derived from three constructs on environment, human capital and labour market competitiveness indices. In Annex E the high factor loadings are shown, jointly accounting for 71.07% of the variance, as well as Bartlett's test of sphericity with $\chi^2 = 62.083$, degrees of freedom = 3, and p-value < 0.001, and the KMO value of 0.599 indicating sampling adequacy.

And fourth, the Smart Cities variable (SMART CITY) comes from five constructs: smart society, smart economy, sustainability and environment, governance, and infrastructure and urban mobility services. As can be seen in Annex F, all factor loadings are higher or around 0.600, and the extracted factor accounts for 66.50% of the variance. Both measures of the Bartlett's test of sphericity with $\chi^2 = 144.957$, degrees of freedom = 10, and p-value < 0.001, and the KMO value of 0.751 indicate sampling adequacy.

4.3. Data analysis

The study of the proposed model was carried out using the Structural Equation Modelling technique with the AMOS 29 software package. This technique allows examining several simultaneous causal relations between multiple variables, both observable and latent. It also facilitates the introduction of the measurement error of the variables within the model specification. The theoretical structural model is formally similar to the multiple regression with multiple equations, as follows:

¹ <https://transparencia.org.es/>

² https://www.abc.es/espana/ranking-alcaldes-mejor-valorados-201011140000_noticia.html

³ <https://www.idencityconsulting.com/indicecompetitividad/>

⁴ <https://www.idencityconsulting.com/indicesmart/>

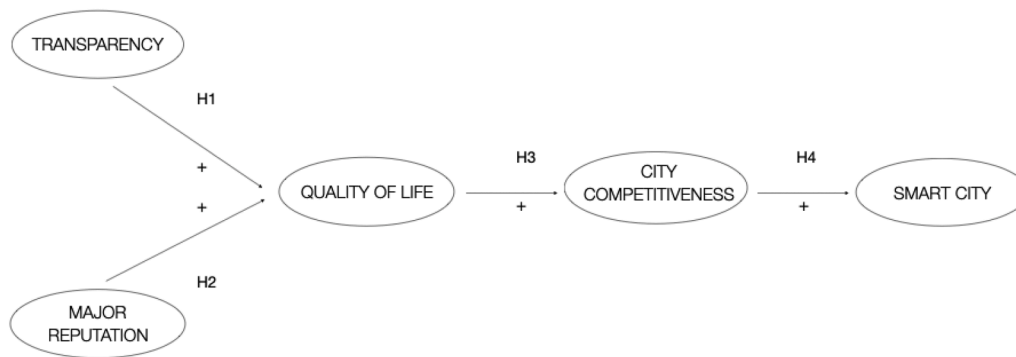


Fig. 1. Proposed theoretical model.

$$\text{QUALITYOFLIFE} = \gamma_1 \text{TRANSPARENCY} + \gamma_2 \text{MAJORREPUTATION} + \varepsilon_1$$

$$\text{CITYCOMPETTIVENESS} = \gamma_3 \text{QUALITYOFLIFE} + \varepsilon_2$$

$$\text{SMARTCITY} = \gamma_4 \text{CITYCOMPETTIVENESS} + \varepsilon_3$$

where ε_1 , ε_2 and ε_3 represent the prediction errors, assumed to be normally distributed. The goodness of fit of the model and the level of significance of the regression coefficients γ_1 , γ_2 , γ_3 and γ_4 will indicate the eventual fulfillment of the four hypotheses proposed. The maximum likelihood method is applied in the test, which generates reliable estimators even with small samples and certain deviations from normality (Hair et al., 2010).

5. Results and discussion

Regarding the test of the relationships proposed in the theoretical model and set out in Section 4.3, a set of indices was used to analyze its goodness-of-fit (Table 1). All statistics were consistent in suggesting that the hypothesized model presents an adequate fit to the data. On the one hand, the chi-square test gives a value of 5.290 with a p-value of 0.381, highly above the threshold of 0.05; while the parsimony measure normed chi-square (chi-square/degrees of freedom) gives a value between 1 and 2, indicating in both cases an adequate fit (Hair et al., 2010). On the other hand, the RMSEA varies between 0 and 1, and values less than 0.05 indicate good fit; this is the case of our model, with a value of 0.027 for this indicator. Finally, several incremental fit measures (NFI, IFI, TLI and CFI) show values above 0.90 and, in most cases, around 0.99; results that suggest a very good fit (Hair et al., 2010).

Regarding the four hypothesized relationships, Fig. 2 shows the standardized regression weights for them. All exhibit the hypothesized positive signs, but, while the estimators of hypotheses 3 and 4 are significant at the 0.01 level, that of hypothesis 1 is significant only at the 0.10 level. As for hypothesis 2, it does not seem to be confirmed by the data.

The objective of this article was to delve into the QoL network of relationships. In this sense, we analyzed both its antecedents, studying the impact of two key factors of good governance, and its results. Regarding the influence of good governance on the QoL of city

Table 1
Goodness-of-fit indices of the structural model.

Fit measure	Value
Chi-square (degrees of freedom) – p-value	5.290 (5) – 0.381
Normed Chi-square	1.058
Root Mean Square Error of Approximation (RMSEA)	0.027
Normed Fit Index (NFI)	0.919
Incremental Fit Index (IFI)	0.995
Tucker-Lewis Index (TLI)	0.983
Comparative Fit Index (CFI)	0.994

inhabitants, the results marginally support ($p < 0.1$) the influence of transparency (Hypothesis 1) and find no support for the influence of reputation (Hypothesis 2).

Regarding the transparency-QoL relationship, previous studies show mixed results. While Cárcaba et al. (2017) found no relationship, De Guimarães et al. (2020) concluded that there was a strong positive relationship. It should be noted that De Guimarães et al. (2020) assessed transparency with a subjective measure, while Cárcaba et al. (2017), as in our study, used an objective measure. These authors pointed out that the lack of relationship could be due to the small number of municipalities in the sample and that the index they used to assess this construct only included formal aspects that satisfy most municipalities. These reasons could also be attributed to our lack of greater significance.

With respect to the lack of relationship between reputation and citizen QoL, this result is in line with Delgado García and De Quevedo Puente (2016) findings. These authors conducted an analysis on a sample of 72 Spanish cities included in the MERCQ City ranking. The initial results of their analysis concluded that while the reputation and performance of cities tended to be in line with each other, there were opposite cases (with high levels of reputation and low levels of performance and vice versa). Moreover, the results of their fsQCA analysis concluded that city reputation was a necessary, but not sufficient, condition for cities to achieve high levels of performance. That is, to achieve good performance, cities require a combination of reputation with other key factors. This is in line with what is proposed by the RBV theory, according to which competitive advantage is not usually based on a single resource, but on a combination of them.

Our study shows a positive relationship between QoL and the competitiveness of cities, supporting hypothesis 3. Cities in which socioeconomic performance, general live-ability conditions and residents' standards are higher enjoyed a higher competitiveness index in the following year. This result evidence the key role of QoL promotion in cities as a fundamental element for the attraction of human capital and is in line with urban amenity theory. This theory holds that urban development derives from the accumulation of human resources and high quality of life (Zeng et al., 2020).

Finally, our study provides initial evidence that cities with a greater competitive advantage will present a higher smart city index in the medium term (three years later), supporting hypothesis 4. This finding is in line with what is proposed by the resource conservation theory (Hobfoll, 1989, 2001). That is, those cities that initially have more resources are in a better position to obtain new resources that allow them to improve their position in the smart city index.

6. Conclusions

This study sought to deepen the role of QoL in cities under the RBV approach (Carvalho et al., 2018; Szymaniec-Mlicka, 2014; Wernerfelt, 1984), improving the knowledge of its antecedents and outcomes. Although there are some studies that have analyzed certain good

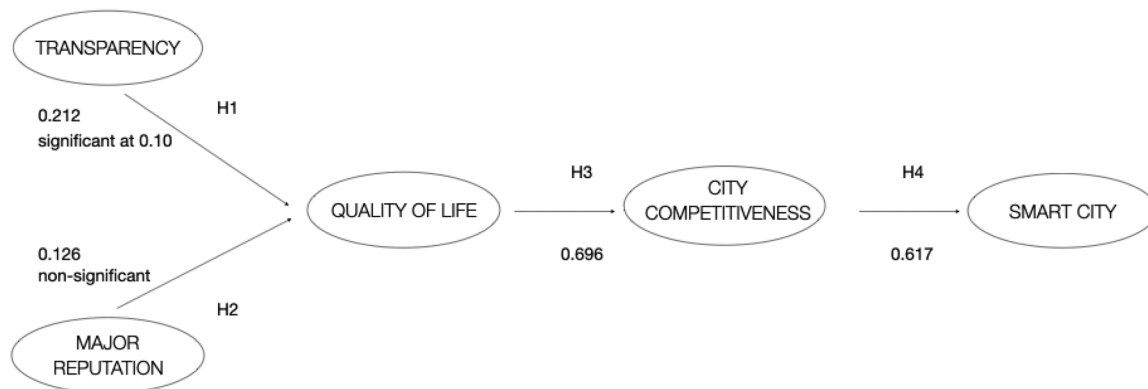


Fig. 2. Standardized regression weights of the proposed theoretical model.

governance resources, their results were not conclusive, so it was necessary to provide new evidence. With respect to its results and its role as a strategic resource, it is a practically unexplored field.

From a theoretical perspective, our study, taking as a basis the RBV theory, positions QoL not only as an important outcome, but also as a strategic resource capable of improving the competitiveness of cities. Likewise, our study provides initial evidence about possible positive resource spirals in cities, relying on resource conservation theory (Hobfoll, 1989, 2001). Those cities that initially have more resources have a greater capacity to generate new resources that allow them to improve their smart city index.

From a practical perspective, this study highlights the relevance of promoting QoL not only as a result in itself, but also as a means to achieve a competitive advantage. In this sense, governments can use benchmarking by trying to find out what policies are implemented in cities with higher QoL rates and implement them in their cities.

Despite the contributions, this study has certain limitations. First, further studies are needed to analyze the impact of other governance factors on QoL. Likewise, as we pointed out previously, new studies are needed in which the transparency criterion includes other less formal aspects that are not met by most cities. Secondly, it would be interesting to have a larger sample of cities, not only in Spain but also in Europe. Finally, new studies analyzing the role of QoL as a strategic resource would be opportune, providing new evidence and allowing for a deeper analysis of this approach. Specifically, it would be of interest to assess the effect of QoL and governance variables on the promotion of city entrepreneurship. While there is some evidence of the effect of institutional policies for the promotion of entrepreneurship at the country level (Sendra-Pons et al., 2022), at the city level it is understudied.

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CRediT authorship contribution statement

María J. Pazos-García: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Vicente López-López:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Resources, Methodology, Conceptualization. **Susana Iglesias-Antelo:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis. **Guadalupe Vila-Vázquez:** Writing – review & editing, Writing – original draft, Visualization, Conceptualization.

Declaration of competing interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jiedeen.2024.100264.

Data availability

Data will be made available on request.

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