

EXAMINING THE RELATIONSHIP BETWEEN INTERACTIVE MARKETING COMMUNICATION AND CITY BRAND EFFECTS

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Purpose: The paper aims to examine the relationship between interactive marketing communication and city brand effects, and whether city size moderates this link.

Design/methodology/approach: The quantitative study covered 140 Polish cities with populations of 20,000 or more. The conceptual model was evaluated using survey data and a two-stage analytic strategy (measurement validation via exploratory and confirmatory factor analysis, followed by structural tests with robust inference). Interactivity was measured with a multi-item scale. City brand effects were modelled as a second-order construct comprising image and key stakeholder effects. City size was tested as a moderator.

Findings: Interactive marketing communication is positively and statistically significantly related to city brand effects (conceptualised as a second-order construct encompassing image, resident, business, tourism, and social effects), and the relationship is substantively meaningful and robust. However, they do not provide empirical support for the moderating role of city size in this relationship, as no reliable differences are observed across population categories in this dataset.

Research limitations/implications: The evidence is based on Polish cities, which limits its generalizability to other institutional and cultural contexts. The study relies on perception-based measures, which are susceptible to attribution bias and common-method variance. Future research can triangulate survey perceptions with objective indicators, apply longitudinal or quasi-experimental designs, test cross-country applicability, and examine reciprocal dynamics between interactivity and brand effects.

Practical implications: Interactivity in marketing communication should be treated as an organisational capability of municipal administration and institutionalised through systematic listening, two-way response, and integration with service-delivery processes to ensure closed feedback loops. City brand effectiveness should be assessed using outcome-oriented, multidimensional measures rather than activity metrics. No evidence of a moderating effect of city size suggests that organisational capabilities and governance mechanisms, not population scale, are the decisive factors.

Originality/value: The study provides validated measures and large-sample tests, and offers robust evidence of the link between interactive marketing communication and city brand effects. As no evidence of a moderating effect of city size was found, attention shifts from scale to organisational capabilities and governance. The study also introduces a reusable CBEf measurement framework.

Keywords: interactive marketing communication, city brand effects, city brand effectiveness, city branding, city marketing communication.

Category of the paper: Research paper.

1. Introduction

Nowadays, city brands should be understood as dynamic, social processes, with value continuously created through interactions between the brand and its stakeholders. Interactive marketing communication (InMC) advances city branding by replacing one-way messaging with structured dialogue and cross-sector collaboration. As a relational, adaptive practice, it recasts stakeholders from passive audiences into partners in meaning-making, cultivating mutual understanding and durable ties. Interactivity operates both as a managerial capability and a participatory process, facilitating dialogue with various stakeholders, strengthening relational capital, promoting engagement, and supporting brand development. This perspective provides a basis for examining how interactive marketing communication contributes to brand effects.

Previous research on interactive marketing communication has predominantly focused on business organisations, while studies in city branding and city marketing have often offered only fragmentary conceptualisations of cities' interactive marketing communication. The scoping review (Mays et al., 2001; Arksey, O'Malley, 2005; Colquhoun et al., 2014), which enabled an exploratory mapping of the literature on interactive marketing communication, city marketing communication, city branding, and city brand effects, revealed a lack of empirical research and coherent theoretical explanation regarding the relationship between interactive marketing communication and city brand effects. This gap, both empirical and exploratory, highlights the need to further investigate the relationship between interactive marketing communication and city brand effects.

The primary objective of this study was to identify and explain the relationship between interactive marketing communication and city brand effects. Furthermore, given that the effects of city branding may vary across contexts, the second objective was to assess whether this relationship is moderated by city size. Understanding the relationship is essential for both theory and practice, as cities may increasingly leverage the potential of interactivity to communicate with stakeholders, foster identification and engagement, and consequently enhance the city brand.

Accordingly, the paper examines whether interactive marketing communication (InMC) enhances city brand effects (CBEf) and whether this link depends on city size. Two hypotheses are tested: H1: InMC is positively related to CBEf. H2: City size moderates the relationship between InMC and CBEf. The model is evaluated using survey data from 140 Polish cities and a two-stage analytic strategy (measurement validation via exploratory factor analysis and

confirmatory factor analysis, followed by structural tests with robust inference). The following sections develop the theoretical background, define the constructs, describe the methodology, including data collection and measures, present the results for H1 and H2 with diagnostics and robustness checks, and conclude by presenting the study's conclusions, including theoretical and practical implications, as well as limitations and suggestions for future research.

2. Theoretical background

2.1. Interactive marketing communication

The evolution of marketing communication reflects a shift from one-way persuasion toward a dynamic, two-way process of interaction between organisations and their audiences. Interactive marketing communication refers to this dialogic, relational, reciprocal, and adaptive process that enables organisations to engage stakeholders in ongoing relationships and co-create value (Kent, Taylor, 2002; Reid, 2005; Finne, Grönroos, 2009; Moriarty, Schultz, 2012; Tafesse, Kitchen, 2017; Daszkiewicz et al., 2023). Interactivity is a fundamental attribute of contemporary communication systems and has become an essential dimension of integrated marketing communication (Porcu et al., 2017; Daszkiewicz et al., 2023).

Initially, the notion of interactivity was primarily associated with digital technology, understood as users' ability to control, manipulate, and respond to online content (Johnson et al., 2006). This approach assumed that if a medium gives the user the ability to choose paths, to reorder content, and to respond, communication already becomes interactive. However, research in marketing communication progressively extended this concept beyond technological affordances to encompass behavioural and relational dynamics between senders and receivers (Kliatchko, 2008; Tafesse, Kitchen, 2017).

Increasingly, scholars underline that interactivity implies a relational orientation: rather than delivering uniform messages to passive audiences, organizations manage a dynamic process of dialogue that enables them to listen, respond, and learn (Finne, Grönroos, 2009; Avidar, 2017; Anderson, 2016; Finne, Grönroos, 2017; Kang et al., 2021). As Moriarty and Schultz (2012a, 2012b) argue, interactivity transforms communication into a continuous feedback system in which each interaction can reinforce or weaken the relationship. This dialogic nature makes interactivity a key driver of trust, engagement, and long-term loyalty (Manser Payne et al., 2017).

Contemporary perspectives, therefore, view marketing communication as a dynamic exchange between organisations and stakeholders (Finne, Grönroos, 2017). Within this paradigm, interactivity is not limited to the technological capacity for feedback but represents a strategic capability that enables dialogue, responsiveness, and relationship building. Porcu

et al. (2017) emphasise that effective integrated marketing communication requires continuous adjustment to stakeholder feedback and contextual changes, resulting in an adaptive, reciprocal communication process. Managing interactive communication involves both listening and participating in stakeholder-generated conversations. Failure to engage in these exchanges may lead to perceptions of organisational distance or unresponsiveness, thereby eroding stakeholder trust (Macnamara, 2019; Bammer, 2024).

Interactive marketing communication can thus be defined as an ongoing, reciprocal process of message exchange and meaning negotiation between the organisation and its stakeholders, characterised by openness, responsiveness, and mutual adaptation (Finne, Grönroos, 2017; Porcu et al., 2017; Daszkiewicz et al., 2023). Extending this perspective, Daszkiewicz et al. (2023) apply the notion of interactivity to the territorial context, defining it as a continuous process of dialogue, monitoring, and feedback between the city and its diverse audiences. Such interactional dynamics support responsiveness and adaptive management in city marketing communication, allowing urban authorities to co-create brand meaning and strengthen relationships with stakeholders.

Although the use of information and communication technologies (ICTs) does not, in itself, guarantee interactivity, their strategic application significantly enhances the potential for interactive communication. Social media, mobile applications, and participatory platforms create opportunities for real-time dialogue, user engagement, and data-driven responsiveness (Mulhern, 2009; Dwivedi et al., 2021). When supported by an appropriate organisational culture and communication strategy, technological tools enable co-creation, feedback, and mutual learning between organisations and stakeholders (Daszkiewicz et al., 2023; Qi et al., 2024).

Table 1.
Dimensions of Interactive Marketing Communication

Dimensions	Conceptual focus	Key features
Processual (dialogue, reciprocity)	Describes how communication processes unfold between the organisation and its stakeholders, emphasising interaction, reciprocity, and shared understanding.	Involves a two-way message exchange where both parties actively participate in creating meaning, leading to shared understanding and stronger relational bonds.
Behavioural (responsiveness)	Refers to how organisations respond to stakeholder feedback and needs, ensuring transparency and authenticity.	Highlights the importance of timely and adequate organisational responses to stakeholder feedback, which enhance transparency, authenticity, and perceived trustworthiness.
Strategic (adaptivity, co-creation)	Explains how insights derived from stakeholder interaction are used to adapt strategies and co-create brand meaning.	Emphasises continuous learning from stakeholder feedback and the use of insights to adjust strategies and co-create brand meaning and value through participatory processes.

Source: Author's own elaboration based on Finne and Grönroos (2009, 2017); Kliatchko (2008); Johnson, Bruner, Kumar (2006); Porcu, del Barrio-García, Kitchen (2019); Tafesse, Kitchen (2017); Prahalad, Ramaswamy (2004); Daszkiewicz, Mazurek, Pukas (2023).

The literature supports the view that interactivity is not a monolithic concept but comprises several interrelated dimensions that describe how organisations and stakeholders engage in communication processes. Table 1 summarises the key dimensions of interactive marketing communication identified in the literature: dialogue and reciprocity, responsiveness, adaptivity and co-creation. The processual dimension (dialogue and reciprocity) captures the interactive flow of communication, the behavioural dimension (responsiveness) relates to organisational reactions and authenticity, and the strategic dimension (adaptivity and co-creation) highlights the organisation's ability to integrate stakeholder input into brand meaning and value creation. Exchange, feedback, and learning emerge as central mechanisms in communication between organisations and their stakeholders. Collectively, these dimensions position interactivity as a strategic resource for building trust, engagement, and long-term brand relationships.

Interactivity reflects a departure from the logic of mass communication toward relationship communication (Finne, Grönroos, 2009, 2017). Interactive marketing communication can therefore be understood not merely as a tactical tool, but also as a strategic capability and process that strengthens relational capital and supports long-term brand building. In the context of city branding, such a relational and adaptive understanding of interactivity provides a conceptual foundation for examining how interactive marketing communication contributes to the brand effects.

2.2. City Branding and City Brand Effects

In recent decades, the branding of places, especially cities, has become an integral part of urban management. Increasing global competition among cities for investment, residents, and visitors, combined with growing societal expectations of participation and transparency, has transformed how city brands are conceived and managed. In response to these changes, scholars and practitioners have increasingly sought to understand city branding as a process through which city brands are formed, expressed, and managed. Interest in evaluating outcomes has also grown, yet this remains challenging due to the complexity of place-branding processes and the need to account for diverse stakeholders.

To understand the city branding conceptually, it is first necessary to outline how the notion of a brand has evolved in recent marketing theory. Brands are increasingly understood as dynamic and social processes whose value is continuously created through interactions between the brand and its stakeholders (Merz et al., 2009). This approach departs from the traditional view of the brand as a firm-owned asset (Keller, 1993; Sinclair, Keller, 2014; Belo, 2014), and instead conceptualises it as a social system of shared meanings, co-created by multiple stakeholders - including the organisation, customers, partners and the broader community. Such a perspective emphasises the relational and interactive nature of branding, where meaning, value and identity are continuously negotiated and reconstructed through stakeholder engagement (Iglesias, Ind, 2020; Iglesias et al., 2020; von Wallpach et al., 2017; Simmons, Durkin, 2023; Keller, 2023).

Existing literature reviews on city branding indicate that the concept has evolved from promotional practices toward a multidimensional process integrating governance, communication, and stakeholder engagement (Lucarelli, 2018; Boisen, Terlouw, Groote, Couwenberg, 2018; Braun et al., 2022). According to Boisen et al. (2018), *city branding* should be distinguished from *marketing* and *promotion*. While promotion focuses on visibility and marketing on exchange, branding refers to the ongoing construction of meaning and identity rooted in stakeholder relationships. This conceptual distinction highlights that city branding is a process linking strategic narratives, identity formation, and participatory communication.

The concept of city branding extends beyond mere promotion or visual identity to encompass a strategic, long-term process of shaping meanings and relationships between a city and its stakeholders (Kavaratzis, 2004; Anholt, 2007; Hankinson, 2010; Zenker, Beckmann, 2013; Lucarelli, 2018). It can thus be understood as a collaborative and adaptive process through which city identities and values are continuously co-created and negotiated through dialogue, interaction, and shared experiences (Eshuis, Klijn, 2012; Kavaratzis, Hatch, 2013; Braun et al., 2022).

In this view, city branding merges marketing logic with governance, integrating economic, social, and cultural objectives and positioning stakeholders as co-creators rather than passive audiences (Eshuis, Edelenbos, 2009; Kavaratzis, Hatch, 2013). Accordingly, city branding is increasingly regarded not merely as a communication strategy but as an ongoing, relational process involving multiple actors whose participation and interaction shape the brand's meaning and legitimacy.

Beyond these communicative and participatory dimensions, recent conceptual work emphasises the importance of understanding city branding as an interactional process shaped by the specific roles that stakeholders assume within it. Källström and Ripoll González (2025) argue that the roles actors assume in the place-branding process influence their propensity for brand citizenship behaviour and voluntary actions that support the place brand.

City branding can be viewed as a cross-sectoral policy process that intersects with education, business, tourism, and social inclusion, generating diverse outcomes that should be identified and assessed (Lucarelli, 2018; Florek et al., 2021; Hereźniak, Florek, 2024). In city branding, the need to evaluate effects is highly justified, as related practices are cross-sectoral and closely tied to multiple public policy domains (Florek et al., 2021).

In the literature, the measurement of city brand effects is often conflated with assessments limited to image-related outcomes. Hereźniak et al. (2018) advocate moving beyond this narrow evaluative sphere and broadening the lens for evaluation of city branding. According to the authors, measuring the effectiveness of a city brand requires integrating perspectives of public management performance and customer-based brand equity for multiple stakeholders (see also Augustyn et al, 2017).

Hereźniak, Florek, and Augustyn (2018) propose designing city-brand effectiveness indicators by integrating a brand-impact perspective (Lucarelli, 2012) with a public management logic framework (Bouckaert, Halligan, 2008). Following this approach, city-brand evaluation may encompass a set of effects, including outputs, outcomes, and impacts, within a flexible structure that accommodates different brand concepts and stakeholder perspectives. Outputs denote direct and immediate effects, relating to tangible results produced during the implementation of branding-related activities (e.g., launched programmes, enhanced city platforms, new procedures, etc.). Outcomes capture mid-term changes in behaviours and perceptions of key stakeholders (e.g., participation in initiatives, growth in city awareness, visitor footfall, willingness to recommend, expansion of partners in social projects). Impacts refer to long-term, enduring changes for stakeholders and the urban system (e.g., investment attractiveness, attraction of new residents, and stronger collaboration climate).

While the role of outputs in the logic chain of city brand building is recognised, outputs are generally treated as production-oriented activity measures with high attribution to implementation (e.g., launched programmes, new procedures, prepared brand carriers) rather than as stakeholder-relevant effects. As the literature typically frames outputs as direct, immediate, and tangible results of actions, they remain useful for monitoring but offer only a limited proxy for effectiveness. Accordingly, the evaluation of city brand effects should concentrate more on outcomes and impacts.

City brand effects can therefore be understood as a multidimensional construct encompassing the overall city image and a range of outcomes and impacts for key stakeholders, including residents, tourists, businesses, investors, and the wider local community.

2.3. Relationship between interactive marketing communication and city brand effects: Theoretical framework and research hypotheses

Cities operate as complex, multi-stakeholder systems in which numerous actors engage in communication and co-create brand meaning (Kavaratzis, Kalandides, 2015; Braun et al., 2013; Lucarelli, 2018). Furthermore, communication in urban governance is not limited to information exchange but also encompasses collaboration, mutual responsiveness, and participatory mechanisms through which stakeholders co-create urban value (Meijer et al., 2012; Meijer et al., 2019; Viale Pereira et al., 2018; Mahmoud et al., 2021; Toukola et al., 2023). Interactive communication enables cities to effectively disseminate information, collect feedback, monitor public reactions and sentiment, and foster participatory relationships with stakeholders. Given the growing recognition of cities as communication-based, co-created brands, understanding how interactive communication relates to brand outcomes is increasingly important.

Quantitative and empirical studies examining the relationship between interactivity and city brand effects are limited and largely fragmentary. One of the few studies addressing this issue is the research by Šerić and Vernuccio (2019), who empirically tested how two dimensions of

integrated marketing communication (IMC) - consistency and interactivity - influence city reputation and consumer brand engagement in a tourism context. Their findings indicate that IMC interactivity had a stronger effect on consumer brand engagement than consistency, and that both IMC dimensions positively influenced city reputation, which in turn was positively associated with consumer brand engagement. These results suggest that interactive communication can enhance stakeholder involvement and strengthen perceptions of city reputation.

However, the Šerić and Vernuccio (2019) study's scope remains limited in several ways. It focuses on tourists, examining the city as a destination brand, and thus does not address the broader concept of the city brand, which includes multiple stakeholder groups such as residents, entrepreneurs, and investors. Moreover, the dependent variables - city reputation and consumer brand engagement - represent selected dimensions of the city's brand effects. Although promising, this study by Šerić and Vernuccio (2019) is limited and does not cover the full range of city brand effects across multiple stakeholder groups. Such evidence thus provides a valuable but partial basis for expecting a positive link between interactive communication and city brand effects.

Braun et al. (2014) state that *place brand communication is most effective when it relies on interaction and experience rather than one-way promotional tools* (Braun et al., 2014, p. 68). The authors, in their quantitative study of Dutch cities, examined how different communication channels influence city attractiveness through brand image. Their results demonstrated that word-of-mouth (WOM) - understood as interpersonal communication and recommendations among residents, visitors, and other stakeholders - had a significantly stronger positive effect on perceived city attractiveness, via improvements in city brand image, than traditional media and symbolic promotional activities. This finding provides empirical support for the notion that dialogic and experience-based communication is more effective in shaping favourable brand perceptions than one-way campaigns. Although the study did not explicitly conceptualise WOM as interactive marketing communication, its results align with the broader view that stakeholder interaction and engagement are key drivers of positive city brand effects.

Theoretical and exploratory studies have long indicated that interaction and dialogue between cities and their stakeholders enhance recognition, shape perceptions, and lead to relational outcomes such as brand attachment and advocacy (Kavaratzis, Hatch, 2013; Braun et al., 2022). These conceptual contributions suggest that such interactional processes may therefore strengthen city brand effects by fostering trust, engagement, and long-term identification with the city. Empirical evidence provides partial support for this view, showing that participatory communication and stakeholder involvement in place branding enhance trust, engagement, and brand-supportive behaviours, although these findings remain limited to specific contexts and stakeholder groups (Klijn et al., 2012; Eshuis et al., 2020).

Klijn et al. (2012) conducted a quantitative study examining how stakeholder involvement within governance structures affects the effectiveness of place branding projects. Their research, based on Dutch municipal branding initiatives, showed that greater actor participation in decision-making processes enhances clarity and internal support for the brand concept. In other words, when city stakeholders are actively involved in shaping and implementing the brand, the resulting place brand tends to be more coherent and broadly endorsed. Although their analysis focused on governance involvement rather than on interactive communication with stakeholders, the findings indirectly support the argument that dialogue and collaboration contribute to stronger city brand outcomes.

Previous research provides fragmented yet broadly consistent evidence that interactive communication enhances key city brand outcomes, including identification, reputation, and stakeholder engagement. However, most existing studies focus on single stakeholder groups (e.g., tourists or residents) or specific communication channels, rather than the multifaceted and multichannel interactivity of city marketing communication. This indicates the need for an integrated approach that captures how interactive marketing communication relates to city brand effects across diverse stakeholders.

The broader relationship between interactive marketing communication and city brand effects remains underexplored and warrants further empirical investigation. Despite limited empirical evidence, existing conceptual and fragmentary studies provide grounds for assuming that interactive marketing communication plays an important role in shaping how city brands are formed and perceived. Prior research indicates that interactivity enhances stakeholder engagement, fosters trust, and facilitates the co-creation of meaning—mechanisms that are likely to generate positive brand-related outcomes. In the context of city branding, such effects are typically expressed as cognitive, affective, and behavioural responses that collectively constitute city brand effects. On this basis, it is reasonable to expect that the perceived interactivity of city marketing communication is positively related to city brand effects.

Previous studies suggest that the effectiveness of city branding and communication strategies varies according to contextual factors such as city size, resource capacity, and level of development. In a recent conceptual contribution, Zenker (2024) argues that “size matters”, as the scale of a city shapes its branding mechanisms by influencing available resources, governance structures, communication channels, and the degree of stakeholder interaction. Empirical evidence supports this view: comparative analyses of urban strategies in Chinese cities demonstrate that municipalities with different population sizes and economic capacities adopt distinct approaches to communication and image management (Ma et al., 2021). Larger cities tend to rely on institutionalised communication systems and external visibility, whereas smaller cities depend more on relational proximity and community engagement. These contextual differences suggest that city size may moderate the relationship between interactive marketing communication and city brand effects.

Based on the reviewed theoretical premises, and in order to examine the relationship between interactive marketing communication and city brand effects while accounting for contextual differences between cities, the following hypotheses were formulated:

H1: There is a positive relationship between interactive marketing communication and city brand effects.

H2: City size moderates the relationship between interactive marketing communication and city brand effects.

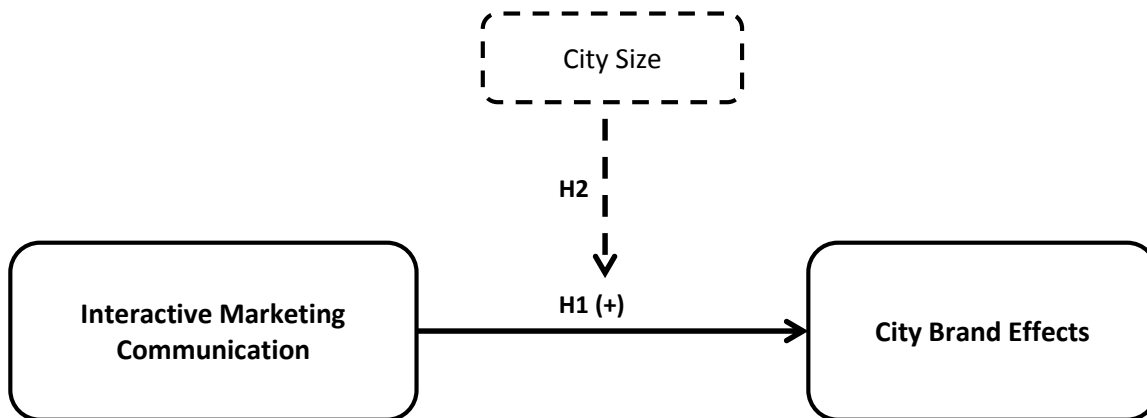


Figure 1. Conceptual model of the relationships between interactive marketing communication and city brand effects.

Building on these hypotheses, a conceptual model was developed to test the relationships between interactive marketing communication and city brand effects, while accounting for the potential moderating role of city size. The conceptual framework is illustrated in Figure 1. The constructs were operationalised using established measurement scales, and the model was empirically examined through the research design described in the next section.

3. Methodology

3.1. Data collection and sample

The quantitative study was conducted on a sample of 140 Polish cities with 20,000 or more residents. The respondents were officials from city or municipal offices who are responsible for decisions regarding the city's marketing communications. The survey was administered between July and August 2025 using a CAWI questionnaire by a research agency with experience in public entity research.

To achieve an adequate response rate, after sending invitations to participate—each including a unique survey link and an authentication letter—follow-up telephone contacts were conducted. The first call verified whether the email had reached the appropriate person and organizational unit. During the conversation, the purpose, scope, and timeline of the study

were outlined, the scientific character of the project was emphasized, and respondents were assured of the anonymity of individual answers and the aggregate nature of the analysis. When necessary, additional calls were made to encourage completion of the questionnaire.

The total population under study consisted of 209 cities with 20,000 or more inhabitants (Statistics Poland, 2024). To determine an appropriate sample size for this finite population, a calculation was performed using a confidence level of 95%, a margin of error of 5%, and an assumed population proportion of 0.5, which yields the most conservative estimate and ensures maximum variability (Babbie, 2020; Creswell, J.W., Creswell, J.D., 2018). According to standard sample size formulas adjusted for finite populations (Israel, 1992), the minimum required sample was approximately 136 cities. In this study, data were collected from 140 cities, which exceeds the calculated threshold. Therefore, the sample size is considered sufficient to ensure statistical validity and generalizability of the findings within the specified confidence parameters. The sample structure, presented by number of residents, is shown in Table 2.

Table 2.
Sample characteristics by city population size

Number of residents	n	%
20,000 to 99,999	106	75.7
100,000-199,999	22	15.7
200,000 and more	12	8.6
Total	140	100.0

Source: Computations based on survey data (N = 140).

Data were collected using a structured questionnaire. The conceptualisation of the model's constructs and the development of the measurement instrument were informed by a literature review, a content analysis of strategic documents from Polish cities, and prior quantitative studies on city marketing communication (Daszkiewicz et al., 2023). Details of the measures are presented in the next subsection of the article.

3.2. Measures

In the study, three variables were included for measurement and analysis: Interactive Marketing Communication (InMC), City Brand Effects (CBEf), and City Size. The constructs of InMC and CBEf were measured using multi-item scales designed to capture respondents' perceptions across several dimensions. Both were treated as latent variables and later assessed for reliability and validity. City Size was treated as a single-item, observed variable, operationalised using population thresholds, and included as an ordinal moderator in the analysis. Table 3 provides a brief overview of the measures; detailed descriptions are provided below.

Table 3.*Brief overview of measures*

Construct	Abbrev.	Measurement	Coding/Aggregation
Interactive Marketing Communication	InMC	6 items; 7-point Likert scale	Mean of six items
City Brand Effects	CBEf	17 items; 7-point Likert scale	Subconstructs means, CBEf as a second-order factor (latent)
City Size	n/a	Ordinal, ranges 20,000-99,999; 100,000-199,999; $\geq 200,000$	Codes 1, 2, 3

Note. To prevent ambiguity, Interactive Marketing Communication is denoted as InMC, differentiating it from IMC, which conventionally refers to Integrated Marketing Communications. Likewise, City Brand Effects is denoted as CBEf to distinguish it from CBE, a label commonly used for City Brand Equity or Corporate Brand Equity in prior research.

Source: Own elaboration.

Interactive Marketing Communication (InMC) was conceptualised as an interactive, relationship-oriented communication process characterised by dialogue, responsiveness, and co-creation. This conceptualisation is consistent with contemporary views of marketing communication as an ongoing two-way, feedback-driven exchange rather than a one-way message transfer (Finne, Grönroos, 2017; Porcu et al., 2017). The InMC construct was operationalised using a six-item scale derived from prior research and adapted to the context of city marketing (Daszkiewicz et al., 2023). The items captured perceived interactivity, including: multi-channel contact and facilitated dialogue with stakeholders; systematic collection and internal sharing of stakeholder feedback; responsiveness enabled by ICT tools; active two-way communication via social media; ongoing development of interactive platforms that support stakeholder dialogue and participation; and monitoring of informal online communication. Respondents evaluated each statement on a seven-point Likert-type scale (1 = “strongly disagree”, 7 = “strongly agree”). For each respondent, a composite InMC score was computed as the arithmetic mean of the six items. No items were reverse-coded.

City Brand Effects (CBEf) were measured using a 17-item scale developed on the basis of existing literature on place and city branding outcomes, brand effectiveness, brand performance, brand equity, and place-related communication effects, with particular attention to the perspectives of multiple stakeholder groups (e.g., Zenker, Martin, 2011; Kavaratzis, Hatch, 2013; Augustyn, Florek, Hereźniak, 2017; Hereźniak et al., 2018; Florek et al., 2021; Alsayel et al., 2022; Sokołowska et al., 2022; Hereźniak, Florek, 2024). The full list of CBEF items is available from the authors upon request. Respondents were asked to indicate the extent to which each effect had applied to their city over the past 3-4 years, using a seven-point Likert scale ranging from 1 ("definitely not") to 7 ("definitely yes").

The CBEf scale was designed to capture a broad range of brand-related effects across five sub-dimensions: Image Effects, Resident-Related Effects, Business-related Effects, Tourism Effects, and Social Effects. The Image Effects construct captures perceived external outcomes of the city brand, specifically: external brand recognition (i.e. increased awareness of the city), brand knowledge (greater familiarity with the city's key attributes among external audiences),

positive media coverage, and the city's overall reputational standing relative to competing cities. These aspects are intentionally excluded from the remaining sub-dimensions (Resident-related Effects, Business-related Effects, Tourism Effects, Social Effects), which focus on stakeholder-specific brand outcomes. Taken together, the sub-dimensions operationalise city brand effects as a multidimensional construct reflecting perceived outcomes of the city's branding efforts for different stakeholder groups. The CBEf construct was modelled as a second-order latent variable, with each dimension treated as a first-order factor in the confirmatory factor analysis.

To collect perceptual responses regarding InMC and CBEf, a seven-point Likert scale was employed. Seven-point scales are widely reported to offer advantages in response sensitivity, discrimination between adjacent categories, and overall data quality. Prior studies indicate that 7-point formats provide a pragmatic balance between measurement precision and respondent burden, and they allow for finer differentiation and more reliable statistical properties than shorter formats such as 5-point scales, without imposing excessive cognitive load on respondents (Finstad, 2010; Leung, 2011; Preston, Colman, 2000; Joshi et al., 2015; Asensio, Revilla, 2022).

City Size was included in the analysis as a moderating variable to account for contextual differences between cities. The decision to include City Size as a moderator is supported by prior research on city branding mechanisms and communication strategies (Zenker, 2024; Ma et al., 2021). The variable was operationalised based on official population thresholds, with three categories: 1 = 20,000-99,999 inhabitants; 2 = 100,000-199,999 inhabitants; 3 = $\geq 200,000$ inhabitants. City Size was treated as an ordinal variable, reflecting the assumption that administrative capacity, communication resources, and stakeholder complexity increase across categories.

3.3. Reliability and validity of measurement scales

Following established guidelines (e.g., Hair et al., 2019; Kline, 2016; Fornell, Larcker, 1981), the measurement model was assessed in three steps. First, dimensionality and item performance were examined through exploratory factor analysis using principal axis factoring. Varimax rotation was applied where multi-factor solutions were expected, and factorability was assessed using KMO and Bartlett's test. Second, internal consistency was evaluated using Cronbach's alpha (Cronbach, 1951). Finally, confirmatory factor analyses were estimated for the first-order InMC and second-order CBEf constructs, reporting standardised loadings, composite reliability (CR), average variance extracted (AVE), and global fit indices (CFI, TLI, RMSEA with 90% CI, SRMR). Convergent validity was indicated by $AVE \geq 0.50$ and $CR \geq 0.70$, while acceptable model fit was typically reflected by $CFI/TLI \geq 0.90-0.95$, $RMSEA \leq 0.08$, and $SRMR \leq 0.08$.

EFA supported the hypothesised structure of both scales. We report summary indices; item-level loadings and communalities are available upon request. For InMC, sampling adequacy and factorability were satisfactory (KMO = .838; Bartlett's test of sphericity, $\chi^2(15) = 392.18$, $p < .001$). A single factor extracted with principal axis factoring (PAF) explained 53.4% of the variance. For CBEf, sampling adequacy and sphericity were strong (KMO = .905; Bartlett's test of sphericity, $\chi^2(136) = 2449.68$, $p < .001$). A theory-driven five-factor solution (Image, Resident, Business, Tourism, Social), extracted with PAF and varimax rotation, accounted for 81.1% of total variance (23.1%, 17.3%, 12.4%, 14.2%, 14.1%, respectively). The loading pattern was clean (primary loadings $\geq |.40|$; no problematic cross-loadings). Given the conceptual relatedness among brand effects, an oblique-rotation robustness check was conducted to verify interactor correlations prior to imposing final CFA constraints.

Internal consistency assessed with Cronbach's alpha, using the conventional $\geq .70$ benchmark for acceptable reliability (Nunnally, Bernstein, 1994). All scales surpassed this threshold. InMC showed good internal consistency ($\alpha = .859$). CBEf subscales exhibited high to very high reliability ($\alpha = .894-.945$). The overall CBEf composite reached a very high level ($\alpha = .954$), a magnitude that can indicate potential item redundancy; accordingly, potential overlap was considered, and the reliability evaluation was complemented with CFA-based indices.

Table 4.
Model Fit Indices (CFA)

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA	RMSEA [90% CI]	SRMR
InMC (first-order)	35.55	9	3.95	.932	.886	.145	[.097-.197]	0.056
CBEf (second-order)	323.14	114	2.83	.915	.898	.114	[.100-.129]	0.070

Note: CFA analyses were performed in R (version 4.x) using the lavaan package (Rosseel, 2012). Detailed CFA outputs are available from the author upon reasonable request due to data-sharing constraints.

Source: Computations based on survey data (N = 140).

Confirmatory factor analysis (CFA) was performed to examine the construct validity of the first-order (InMC) and second-order (CBEf) measurement models. Table 4 presents the model fit indices. Although RMSEA values were elevated (InMC: 0.145 [0.097-0.197]; CBEf: 0.114 [0.100-0.129]), the comparative fit indices (CFI $\approx$ 0.90, TLI $\approx$ 0.90) and SRMR $<$ 0.080 meet commonly used "acceptable" thresholds for exploratory social science applications, provided that cutoffs are applied cautiously and contextually (Marsh et al., 2004; Hair et al., 2019).

Convergent validity and composite reliability were evaluated using the average variance extracted (AVE) and composite reliability (CR). Convergent validity is supported for all constructs: AVE $\geq .50$ in every case (InMC = .533; Image = .809; Resident = .733; Business = .841; Tourism = .871; Social = .697). Composite reliability is uniformly high: CR $\geq .87$ (InMC = .870; the CBEf dimensions range from .901 to .944). These values meet or exceed common benchmarks (AVE $\geq .50$, CR $\geq .70-.80$) and indicate well-defined latent constructs.

Despite elevated RMSEA values, comparative fit indices (CFI, TLI) and SRMR suggest an acceptable fit for complex models with moderate sample sizes. Together with high CR and AVE, these results support the convergent and discriminant validity of the measurement model (Hair et al., 2019; Kline, 2016).

Additional validity evidence is provided by two complementary approaches: the Fornell–Larcker criterion (comparing $\sqrt{\text{AVE}}$ with inter-construct correlations) and the HTMT ratio, a stricter check of discriminant validity (Fornell, Larcker, 1981; Henseler et al., 2015). All diagonal $\sqrt{\text{AVE}}$ values (0.73–0.93) exceed inter-construct correlations (0.37–0.80), indicating discriminant validity. HTMT ratios remain below 0.90 (max = 0.854 for Image–Resident; min = 0.408 for InMC–Tourism), reinforcing this conclusion.

Overall, the measurement model is solid enough for the structural analyses that follow. Internal consistency is good to excellent (InMC $\alpha = .859$; CBEf subscales $\alpha = .894$ – $.945$; CBEf $\alpha = .954$), with $\text{CR} \geq .87$ and $\text{AVE} \geq .50$ across all constructs, confirming convergent validity. Discriminant validity is supported by both Fornell–Larcker ($\sqrt{\text{AVE}} = .73$ – $.93$ exceeding inter-construct correlations .37–.80) and $\text{HTMT} < .90$ (max .854). Although RMSEA is elevated (InMC .145; CBEf .114), the remaining fit indices are acceptable for this context (CFI $\approx .93$ /.92, TLI $\approx .89$ /.90, SRMR = .056/.070; $N = 140$). Collectively, the measures exhibit adequate reliability and validity

4. Results

4.1. Descriptive statistics and correlations

This subsection reports descriptive statistics and zero-order associations among the study variables. Interactive Marketing Communication (InMC) and City Brand Effects (CBEf) were measured on 7-point Likert scales, with the overall CBEf indicator operationalised as a second-order composite formed by equal weighting of the five first-order dimensions (Image, Resident, Business, Tourism, Social). City Size (ordinal, coded 1–3) is included for completeness. The descriptive results provide a baseline characterisation of the sample ($N = 140$) and inform the interpretation of subsequent analyses. Pearson correlations are presented for comparability across variables, and the corresponding conclusions from complementary Spearman's rho analyses are summarised.

Table 5.
Descriptive statistics

Variable		Min	Max	Mean	SD
InMC		1.50	7.00	5.03	1.16
CBEf		1.80	7.00	5.00	1.05
CBEf subscales	Image	2.25	7.00	5.21	1.32
	Resident	2.25	7.00	4.94	1.25
	Business	1.00	7.00	4.88	1.26
	Tourism	1.00	7.00	4.91	1.55
	Social	1.00	7.00	5.08	1.04
City Size (1-3)		1.00	3.00	1.33	0.63

Note. InMC and CBEf were measured on 7-point Likert scales. CBEfis a second-order composite (equal-weighted mean of Image, Resident, Business, Tourism, and Social Effects). City Size was coded as City size was coded as 1 = 20,000-99,999, 2 = 100,000-199,999, 3 = $\geq 200,000$.

Source: Computations based on survey data (N = 140).

Descriptive statistics (Table 5) indicate that Interactive Marketing Communication (InMC) and the second-order City Brand Effects (CBEf_total) were above the scale midpoint on the 7-point Likert metric, with adequate dispersion (InMC: M = 5.03, SD = 1.16; CBEf_total: M = 5.00, SD = 1.05; N = 140). These means suggest that, on average, respondents rated both the level of interactive communication and the aggregate brand effects favourably. The standard deviations (≈ 1.0 -1.2) indicate sufficient between-city variability for subsequent analyses, with no indication of floor or ceiling compression around the scale endpoints. CBEfis was operationalised as a second-order composite (equal-weighted mean of the Image, Resident, Business, Tourism, and Social dimensions), reducing item-count imbalances across subdimensions and yielding a balanced overall index.

Table 6.
Pearson correlations among study variables (two-tailed)

	InMC	CBEf	CBEf subscales					City Size
			Image	Resident	Business	Tourism	Social	
InMC	—	0.598***	0.523***	0.509***	0.508***	0.373***	0.572***	0.238**
CBEf	0.598***	—	0.865***	0.864***	0.717***	0.804***	0.848***	0.238**
Image	0.523***	0.865***	—	0.797***	0.425***	0.607***	0.724***	0.132
Resident	0.509***	0.864***	0.797***	—	0.478***	0.547***	0.756***	0.091
Business	0.508***	0.717***	0.425***	0.478***	—	0.502***	0.546***	0.285***
Tourism	0.373***	0.804***	0.607***	0.547***	0.502***	—	0.535***	0.288***
Social	0.572***	0.848***	0.724***	0.756***	0.546***	0.535***	—	0.150
City Size	0.238**	0.238**	0.132	0.091	0.285***	0.288***	0.150	—

Note. Entries are Pearson's r (two-tailed); for City Size (ordinal), Spearman's ρ is shown in brackets. $p < .05$, $p < .01$, $p < .001$. The diagonal shows an em dash. CBEf is a second-order factor reflected by five first-order subscales (Image, Resident, Business, Tourism, Social). City size categories: 1 = 20,000-99,999, 2 = 100,000-199,999, 3 = $\geq 200,000$.

Source: Computations based on survey data (N = 140).

Pearson correlations (Table 6) indicate a positive and statistically significant association between Interactive Marketing Communication (InMC) and the second-order City Brand Effects (CBEf_total), $r = 0.598$, $p < .001$ (N = 140). A similar positive pattern emerges across each of the five first-order CBEf dimensions (Image, Resident, Business, Tourism, Social), confirming that higher levels of interactive communication co-occur with stronger brand

outcomes at both the aggregate and subdimension levels. Given the ordinal coding of City Size (ordinal, 1-3), Pearson coefficients are reported for comparability with the other variables. Complementary Spearman's rho results were consistent with the Pearson findings, indicating similar direction and magnitude of association. The rank-order association between InMC and the second-order CBEf was positive and substantial ($\rho = 0.594$, $p < .001$; $N = 140$), closely mirroring the Pearson estimate ($r = 0.598$). This convergence indicates a robust, monotonic relationship not driven by distributional assumptions or outliers. Correlations involving City Size were positive but comparatively modest (City Size–CBEf: $\rho = 0.223$, $p = .008$; City Size–InMC: $\rho = 0.254$, $p = .002$). Full Spearman correlation matrices (with p-values) are available from the authors upon request.

The descriptive statistics indicate that both Interactive Marketing Communication (InMC) and City Brand Effects (CBEf) were rated above the midpoint of the scale, suggesting generally positive perceptions among respondents. Pearson correlations revealed significant, positive associations between InMC and all five dimensions of city brand effects, supporting a consistent relationship between interactive communication and brand outcomes. These findings provide preliminary evidence for the hypothesised positive link between interactive marketing communication and city brand effects, justifying further examination in the structural model.

Overall, the descriptive results and correlation patterns provide preliminary support for the hypothesised associations and lay the groundwork for the formal testing of the conceptual model in the next section.

4.2. Assessment of the conceptual model and hypothesis testing

Following established recommendations for conceptual model assessment (Kline, 2016; Hair et al., 2019), we first validated the measurement structure using confirmatory factor analysis (CFA) and then assessed the structural model to test the hypothesised relationships (see Fig. 1).

To evaluate the proposed conceptual model, a two-stage analytical approach was adopted. First, the measurement model was assessed using confirmatory factor analysis to ensure the validity and reliability of the latent constructs (Brown, 2015; Hair et al., 2019). This step confirmed that the constructs—Interactive Marketing Communication and City Brand Effects—were measured with satisfactory internal consistency and factorial validity.

Second, the structural model was tested to examine the hypothesised relationships between the variables. Two hypotheses were formulated: H1 assessed whether interactive marketing communication is positively associated with city brand effects, while H2 examined whether this relationship is moderated by city size. The constructs of Interactive Marketing Communication and City Brand Effects were operationalised as latent factor scores derived from validated measurement models. City Brand Effects was modelled as a second-order latent construct comprising five subdimensions: Image, Resident, Business, Tourism, and Social Effects.

Hypotheses were tested using regression-based analysis with heteroskedasticity-consistent standard errors (HC3), which provide robust inference in the presence of non-normality or heteroskedasticity in the residuals (Long, Ervin, 2000; Hayes, 2018). City size was included as an ordinal moderator, coded as follows: 1 = 20,000-99,999; 2 = 100,000-199,999; 3 = $\geq 200,000$ inhabitants. The following subsections present the results of the hypothesis testing and structural model evaluation.

4.2.1. Regression analysis (H1)

To empirically test the first hypothesis (H1) and assess the positive relationship between interactive marketing communication (InMC) and city brand effects (CBEf), a regression analysis was conducted. Both constructs were operationalised as standardised latent factor scores, with CBEf modelled as a second-order construct.

H1 was tested using ordinary least squares (OLS) with the dependent variable operationalised as the second-order latent factor score of overall City brand effects (CBEf). Factor scores were derived via Bartlett scoring from standardised CFA loadings. First, first-order factor scores for Image, Resident, Business, Tourism, and Social were computed; next, these scores were combined using their standardised second-order loadings to form the second-order outcome. Interactive Marketing Communication (InMC) was represented by a first-order latent factor score derived from six indicators. Both factor scores were standardised prior to estimation. The report includes classical OLS and HC3-robust inference, model fit, and diagnostic summaries in a single compact table.

Table 7 presents the standardised regression coefficient for InMC predicting the second-order CBEf together with classical and HC3-robust standard errors, t-statistics and p-values. The table also reports the sample size (N), R^2 and adjusted R^2 , the overall F test, Cohen's f^2 as an effect-size index, and the 95% confidence interval for the slope. Finally, normality, heteroskedasticity and influence diagnostics are provided to contextualise the inference and motivate emphasis on HC3 where relevant.

The results confirm the hypothesised positive relationship between Interactive Marketing Communication (InMC) and overall City brand effects (CBEf). With CBEf modelled as a second-order construct (factor score), the standardised OLS estimate was $b = 0.536$, $t(138) = 7.42$, $p < .001$; 95% CI [0.393, 0.679]. The HC3-robust inference was convergent ($t = 7.38$, $p < .001$), and the model explained $R^2 = 0.285$ (Adj. $R^2 = 0.280$). Substantively, this positive relationship implies that a one-SD increase in InMC is associated with a ≈ 0.54 -SD increase in overall city brand effects, aggregating the image, resident, business, tourism, and social dimensions.

Table 7.*OLS regression: InMC → CBEf (second-order) — coefficients, model fit, and diagnostics*

Coefficients (standardized factor scores; OLS with HC3)							
Predictor	b (std.)	SE (OLS)	t (OLS)	p (OLS)	SE (HC3)	t (HC3)	p (HC3)
InMC (latent)	0.536	0.072	7.42	< .001	0.073	7.38	< .001
Model fit							
N	R ²	Adj. R ²	F (1, N-2)	Cohen's f ²		95% CI for b (OLS)	
140	0.285	0.280	55.04 (p < .001)	0.399		[0.393, 0.679]	
Diagnostics (brief)							
AD normality A ² (p)		Breusch–Pagan LM (p)		Max Cook's D		Obs. > 4/N	
1.11 (= 0.006)		2.63 (= 0.105)		0.064		6	

Note. The dependent variable is the overall City brand effects (CBEf) operationalised as a second-order latent factor score. Coefficients are estimated on standardised factor scores; SE (OLS) = classical standard errors; SE (HC3) = heteroskedasticity-robust standard errors.

Source: Calculations based on survey data; statistical methodology informed by Hayes (2018), Kline (2016), Long, Ervin (2000).

Model diagnostics indicated minor deviations from strict OLS assumptions (non-normal residuals and several higher-influence observations), but no strong heteroskedasticity (Breusch–Pagan $p = 0.105$), and the HC3-robust results were virtually identical to classical OLS ($t = 7.38$ vs. 7.42 , both $p < .001$). This indicates that the estimated InMC effect is stable to these diagnostic concerns.

The evidence supports H1. InMC shows a positive and statistically significant relationship with CBEf ($b = 0.536$, $p < .001$), with a substantively meaningful effect size ($f^2 = 0.399$) and robust to standard diagnostic concerns and to convergence of OLS and HC3 inference despite the noted assumption violations. Concluding, Interactive Marketing Communication is positively and statistically significantly related to overall City Brand Effects.

4.2.2. Moderation analysis (H2)

To empirically test the second hypothesis (H2) and assess whether City Size moderates the relationship between interactive marketing communication (InMC) and city brand effects (CBEf), an OLS moderation model with HC3-robust inference was estimated using latent factor scores derived from the CFA. Specifically, CBEf was operationalised as a second-order factor reconstructed via Bartlett scoring from standardised loadings (R output), and InMC was estimated as a first-order Bartlett factor from six items; InMC and City Size (coded 1-3) were mean-centred prior to forming the interaction term ($\text{InMC} \times \text{City Size}$). Standardised coefficients $\beta(\text{HC3})$ for the moderation model are reported in Table 8, and HC3 simple slopes of the $\text{InMC} \rightarrow \text{CBEf}$ association across City Size categories (1, 2, 3) are provided in Table 8.

Table 8.*Moderation model predicting CBEf*

Term	β (HC3)	t	p
InMC	0.478	5.651	< .001
CitySize	0.110	1.240	0.217
InMC $\times$ CitySize	-0.194	-1.574	0.118

Note. Standardised β (HC3). City Size coded 1-3; interaction from standardised terms. DV = second-order CBEf factor score (Bartlett, from CFA). HC3-robust SE. $R^2 = 0.300$; $N = 140$.

Source: Calculations based on the original survey dataset; CFA (R output); OLS with HC3.

The City Size $\times$ InMC interaction was not statistically significant ($\beta(\text{HC3}) = -0.194$, $t = -1.57$, $p = .118$), indicating no reliable evidence that the association between interactive marketing communication (InMC) and city brand effects (CBEf_total, second-order) differs across City Size categories in this sample. The main effect of InMC remained positive and statistically significant ($\beta = 0.478$, $p < .001$), consistent with the expectation of a positive relationship between interactive communication and overall city brand effects. The main effect of City Size was positive but not significant ($\beta = 0.110$, $p = .217$). Overall model fit was modest ($R^2 = 0.300$; $N = 140$), indicating that the predictors account for approximately 30% of the variance in the second-order city brand effects score.

The results are consistent with a positive relationship between InMC and overall city brand effects, while providing no reliable evidence that this relationship varies by City Size in the analysed data. Any apparent differences across City Size categories should be considered exploratory, given the non-significant interaction under HC3-robust inference.

Although the City Size $\times$ InMC interaction was not statistically significant, conditional effects are reported for transparency. Table 9 presents HC3-robust simple slopes of the InMC $\rightarrow$ CBEf association across City Size categories (1, 2, 3). Simple slopes were obtained from the centred specification of the moderation model (InMC and City Size mean-centred prior to forming the interaction) and are reported with HC3 standard errors, t-values, and p-values. These estimates indicate the expected change in the second-order city brand effects score associated with a one-unit increase in InMC at each City Size category and should be interpreted descriptively given the non-significant interaction.

Table 9.

Simple slopes of InMC $\rightarrow$ CBEf across City Size categories (HC3)

City Size categories	Simple Slope (b)	SE (HC3)	t	p
(1) 20,000-99,999	0.547	0.076	7.18	< .001
(2) 100,000-199,999	0.245	0.177	1.39	0.168
(3) $\geq 200,000$ inhabitants	-0.057	0.355	-0.16	0.873

Note: Simple slopes from the centered model; HC3-robust SE, t, and p. Slopes indicate the change in second-order CBEf per one-unit increase in InMC at each City Size category (1, 2, 3). No multiple-comparison adjustments.

Source. Calculations based on the same dataset; OLS moderation with HC3; City Size coded 1-3.

Residual normality was rejected by the Anderson–Darling test ($A^2 = 1.055$, $p = .009$), indicating departures from normality. The Breusch–Pagan test provided borderline evidence of heteroskedasticity, near the conventional 5% threshold ($LM = 7.77$, $p = .051$; $F = 2.66$, $p = .051$). These features justify the use of HC3-robust inference, which is designed to mitigate size distortions under non-normal and heteroskedastic errors. Influence diagnostics indicated some influential observations: the maximum Cook's D was 0.106, with 6 cases exceeding the $4/N$ threshold (0.029). This pattern may indicate relatively influential cases; HC3-robust inference was used to reduce potential impact, and the findings should be interpreted with appropriate caution. Taken together, the diagnostics support reliance on HC3-robust standard

errors and warrant a cautious interpretation of p -values. Importantly, the substantive pattern reported for H2 (non-significant interaction; positive main effect of InMC; non-significant main effect of City Size) is consistent with inference procedures that are robust to these diagnostic features.

The results of the moderation analysis indicate that the City Size $\times$ InMC interaction was not statistically significant ($\beta(\text{HC3}) = -0.194$, $t = -1.57$, $p = .118$), providing no evidence of moderation by City Size. InMC showed a positive, significant association with CBEf ($\beta = 0.478$, $p < .001$), whereas City Size was not significant ($\beta = 0.110$, $p = .217$). Simple slopes across City Size categories are reported for completeness and should be interpreted descriptively, given the non-significant interaction. The results provide no evidence of moderation by City Size, therefore H2 was not supported in the analysed data.

4.2.3. Hypothesis testing results

The empirical findings support Hypothesis 1 (H1), which posits a positive relationship between interactive marketing communication (InMC) and city brand effects (CBEf). Regression analysis using standardised latent factor scores confirmed that InMC was a significant predictor of overall city brand outcomes, operationalised as a second-order construct comprising image, resident, business, tourism, and social dimensions. The effect size was both statistically significant and substantively meaningful ($\beta = 0.536$, $p < .001$, $R^2 = 0.285$), indicating that higher levels of perceived interactivity in city marketing communication are associated with stronger brand-related outcomes.

Hypothesis 2 (H2), which proposed a moderating effect of city size on the InMC–CBEf relationship, was not supported. Although the interaction term (InMC $\times$ City Size) was included in the moderation model, it did not reach statistical significance ($\beta = -0.194$, $p = .118$), suggesting that the strength of the relationship between interactive marketing communication and brand effects does not differ significantly across cities of varying population size. The main effect of InMC remained positive and robust across specifications.

Table 10.

Summary of hypothesis testing

Hypothesis	Relationship	Result
H1	InMC $\rightarrow$ CBEf	Supported
H2	City size $\times$ InMC $\rightarrow$ CBEf	Not supported

Source: Original survey, $N = 140$.

Table 10 summarises the hypothesis tests: H1 is supported (InMC $\rightarrow$ CBEf), whereas H2 is not (City size $\times$ InMC $\rightarrow$ CBEf). The results confirm the relevance of interactive marketing communication for enhancing city brand effects. However, they do not provide empirical support for the moderating role of city size in this relationship.

5. Conclusions and implications

The study examined whether Interactive Marketing Communication (InMC) is associated with City Brand Effects (CBEf) and whether this relationship differs by city size. The study verified the proposed conceptual model and provided valuable theoretical and practical insights.

Across 140 Polish cities ($\geq 20,000$ residents; survey July–August 2025), InMC showed a positive and statistically significant relationship with overall CBEf, modelled as a second-order construct aggregating image, resident, business, tourism and social effects (standardised OLS: $b = 0.536$, $p < .001$, $R^2 = 0.285$). The effect was substantively meaningful and robust to HC3 inference and standard diagnostics. In contrast, city size did not moderate the association ($\beta = -0.194$, $p = .118$), indicating no reliable differences across population categories in this dataset. This means that Hypothesis H1 was confirmed, indicating a positive relationship between interactive marketing communication and city brand effects. In contrast, Hypothesis H2, which assumed a moderating role of city size, was not confirmed. These results suggest that the more cities engage in interactive communication activities, the more pronounced the positive overall brand effects become.

The research reveals several valuable theoretical implications. The findings reinforce relational explanations of city branding: more interactive communication is associated with stronger city-brand effects (image, social, business, tourism, and resident-related). This supports the view of branding as a dialogic, multi-stakeholder process in which responsiveness and co-creation yield outcomes that matter to various publics.

The city size did not reliably moderate the relationship between InMC and CBEf in this sample and research design, implying broadly comparable effects across population brackets. Any apparent differences in simple slopes are exploratory, given the non-significant interaction under HC3-robust inference. Theoretically, attention should shift from scale to organisational capabilities and governance as the more plausible boundary conditions.

The study contributes measurement structure by operationalising CBEf as a second-order latent variable with adequate reliability and validity ($\alpha \geq .859$; $CR \geq .87$; $AVE \geq .50$; $HTMT < .90$). Despite elevated RMSEA, other fit indices are acceptable for the study's design ($CFI/TLI \approx .90$; $SRMR < .08$), enabling cautious use of latent scores in structural tests. Subject to further validation, this integrated framework may be reusable in future research.

Based on the empirical findings, several practical and policy implications emerge. Interactivity in marketing communication should be understood as a key organisational capability. Therefore, cities should institutionalise processes for listening and for timely, two-way responses (e.g., service standards for response time, the share of dialogic exchanges, and closed feedback loops). This requires the use and development of actionable levers, including this platform and tools that enable and support interactive communication.

From a city-branding standpoint, evaluation should extend beyond outputs (such as the number of posts, events, and reach) and focus on outcomes and impacts, meaning changes in the city's image, shifts in stakeholders' attitudes and behaviours, and their longer-term consequences. When evaluating effects, it may be helpful to anchor measurements in the multidimensional structure of city brand effects employed in this study.

Since city size did not reliably moderate the InMC–CBEf relationship in this sample and research design, scale is not a limiting condition in this context. Cities of different sizes can implement interactive marketing communications and achieve positive city-brand effects. Smaller cities can exploit organisational proximity and community-based channels to strengthen dialogic exchanges (e.g., direct engagement, neighbourhood forums, locally moderated social media), while larger cities should prioritise platform governance (clear ownership, service-level standards, data stewardship) and process integration across departments to sustain responsiveness at scale. Regardless of city size, interactivity should be treated as a capability and supported by tools for performance management, monitoring, and evaluation.

6. Limitations and future research

The study has limitations that qualify the inferences and point to clear avenues for future work. First, the evidence is based on Polish cities, which limits its generalizability to other institutional and cultural contexts. Differences in governance arrangements, administrative digitalisation, and communication norms may condition both the measurement approach and the observed effects. Future research should conduct cross-country or cross-regional comparisons and test measurement invariance to assess whether the CBEf structure and effect sizes hold in other contexts. Second, the study relies on perception-based measures, which are susceptible to attribution bias and common-method variance. While perceptions are central to city branding, a fuller assessment should triangulate with objective indicators (administrative records, behavioural traces, responsiveness metrics) and employ longitudinal or quasi-experimental designs, as well as multi-source, multi-wave data, to strengthen causal inference and separate intervention effects from background noise.

Future research should examine the potential reciprocity between interactive marketing communication and city brand effects. The present study examined the relationship between interactivity and the formation of city brand effects. However, these effects can increase interactivity by motivating stakeholders to engage in dialogue and participation. The feedback mechanism accords with relational, co-creative views of city branding, in which communication processes and brand outcomes co-evolve. Testing this reciprocal dynamic would provide a more process-oriented account of city brand communication as a continually

evolving system of stakeholder interactions. Longitudinal and mixed-method designs would be especially valuable for establishing temporal ordering and capturing mutual reinforcement over time.

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