World heritage designation and residential property values: The case of Old Rauma, Finland

Abstract

Purpose: The purpose of this paper is to evaluate the impact of beneficial externality generated by the World Heritage List (WHL) on residential property values in order to offer new insights into heritage discourses.

Design/methodology/approach: The study uses the hedonic price model to estimate empirically the difference in prices for residential properties located in the Old Rauma World Heritage. The study uses residential sales transaction data from the City of Rauma from January 2005 to September 2012 drawn from an online database called KVKL Hintaseurantapalvelu managed by the Central Federation of Finnish Real Estate Agencies.

Findings: The research results indicate a positive, but insignificant, relationship between the property sale prices (euros/sqm) and heritage designation. However, the total sale prices are higher in Old Rauma as the properties are significantly larger in Old Rauma compared to other properties in Rauma.

Originality/value: Studies in heritage economics have assessed the influence of the property market on heritage listing and designation at either the national level, the local level or a mix of national/local levels. This paper contributes to the literature by analysing the impact of a UNESCO world heritage designation on residential property values. UNESCO is the leading global institution which deals with the protection of heritage sites that transcend national and local boundaries.

Keywords: Old Rauma, heritage conservation, outstanding universal value (OUV), residential property values, world heritage designation.

1. Introduction

Since the emergence of heritage economics, there have been significant advances in the practice and methods of assessing cultural heritage, especially pertaining to the valuation of heritage-listed buildings and designation areas. The existing research analyses the link between the level of heritage protection and the economic benefits attributed to the historical characteristics of buildings, monuments and sites derived from their ownership, management and conservation in property markets. Within this context, the focus of heritage economics has mostly been on cultural heritage assets that are within or at the boundary of the local/national listing and designation whilst scholarly research on the impact of WHL on property market values remains limited or 'more scarce'. This research sets out to evaluate and shed light on the effects of the World Heritage List (WHL) on residential property values in order to offer new insights into heritage discourse.

Against this background, this study analyses the impact of the World Heritage List on residential property values in the City of Rauma (or Rauma) in Finland. Founded in 1442 while under Konungariket Sverige rule, Rauma is the third oldest town in Finland and in 2019 had a population of 39,205 people (Statistics Finland, 2019). It is located in the western Satakunta region. The development of Rauma is linked to its maritime industry, which facilitates the import, export and transit distribution of goods – in 2019, the port handled around over six

million tons of cargo (De Andres Gonzalez et al., 2021). The case study for this paper is the Nordic wood town of Old Rauma, which is located at the heart of Rauma and is listed as a World Heritage site (Section 3).

The paper uses the hedonic price model of the housing market to analyse sales transaction data from the City of Rauma downloaded from a Finnish online database called *KVKL Hintaseurantapalvelu*, which is managed by the Central Federation of Finnish Real Estate Agencies. The dataset included 1,766 residential properties sold in Rauma between January 2005 and September 2012. In this analysis, it was found that residential properties in the Old Rauma Heritage Site do not have a significant price difference (euros/sqm) compared to similar residential properties located in the non-WHL designation of Rauma. However, it was also found that residential properties in Old Rauma Heritage Sites are significantly larger in floor area (m^2) compared to non-WHL designated properties and – as expected – fetched higher total sale prices.

The paper proceeds as follows: Section Two provides an overview of UNESCO's World Heritage List; Section Three describes the value of cultural resources drawn from a review of heritage economics literature to define and understand World Heritage Sites (WHS); Section Four focuses on the inscription and management of Old Rauma, one of Finland's seven WHS; Section Five establishes a methodological framework, including a description of the dataset and analytical strategy used in this paper, with reference to residential properties; Section Six presents the findings in relation to the market prices of residential properties in Old Rauma and Section Seven contains a brief conclusion and identifies areas for future study.

2. UNESCO World Heritage List

Established under the 1972 UNESCO World Heritage Convention (WH Convention),[1] the World Heritage List (WHL) contains a list of internationally protected sites of both cultural resources, such as historic buildings monuments and sites, and natural resources, such as landscapes, marine areas and forests/wildernesses, that possess outstanding universal value (or are considered invaluable) for current and future generations of all humanity (Titchen, 1996). The WH Convention came into effect after the member states recognised the need to safeguard outstanding heritage sites from destruction during armed conflicts such as world wars (Meskell, 2013), for example: the destruction of the Cathedral of Notre-Dame during World War II, and modernity and development pressures in the built environment, as faced by the Fort and Shalamar Gardens in Lahore, which are being threatened by urban expansion (Jones et al., 2020).

With advisory support from the International Council on Monuments and Sites (ICOMOS) and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), the World Heritage Committee, which is made up of 21 State Parties (Article 8 of the WH Convention), can implement its protection strategy for cultural resources of outstanding interests proposed for inscription on the WHL by the State Party. That is, the

1 UNESCO refers to United Nations Educational, Scientific and Cultural Organization. For further information regarding the establishment of the concept and practice of UNESCO World Heritage Convention, see Dennis, R. (2012). The UNESCO World Heritage Convention, 1972–2012: Reflections and directions. *The Historic Environment: Policy & Practice*, 3:(1), 64-85. https://doi.org/10.1179/1756750512Z.0000000004.

WH Convention requires all State Parties to '*endeavour, in so far as possible*' to protect heritage sites inscribed on the WHL in their own national boundaries (Article 5 of the WH Convention). So, while working collectively to protect the past, each state party is expected to adopt the legal, technical and financial measures necessary to conserve its cultural resources with outstanding universal value. In relation to cultural heritage, cultural sites are considered of '*outstanding universal value*' (OUV) if they represent authentic qualities – referring to true to form or value (Gao and Jones, 2020) – to sites or objects that collectively transcend the national boundaries of a particular culture and, thus, contribute to the international community (Vigneron, 2016).

Whilst the term OUV appears clear, it is in fact specious, as is explored by others in detail (e.g., Alberts and Hazen, 2010; Cameron, 2020; Jokilehto and Cameron, 2008; Schmutz and Elliott, 2017). According to Von Droste (2011), OUV in its broadest sense can be regarded as a human rights approach based on integrated universal principles geared toward safeguarding cultural properties that belong to all humankind and that represent individual collective pasts as highlighted by UNESCO (2013a; 2013b), recognising that the OUV of WHS lies in both its individual and collective rights (detailed in Section 3). The integrated universal principles (e.g., the WH Convention and its Operational Guidelines) relate to determinations of which cultural properties are to be inscribed in the WHL and the way in which they are to be conserved (Titchen, 1996). As already discussed by Schmutz and Elliott (2017), this approach to OUV focuses on the politics of the WH inscription, in which practical or empirical case studies are designed to highlight stakeholder perspectives that can be used to support desired sustainable outcomes for world heritage designation. As such, there are numerous case-based research studies on sustainable outcomes that societies achieve from WHS. For example: social sustainability in relation to multiculturalism, inclusion and diversity (Boussaa 2014; Leus and Verhelst, 2018; Labadi, 2007; Offenhäußer, 2010); environmental sustainability related to greenhouse gas emissions and climate change (Ijla and Broström, 2015; Yung and Chan, 2012); and economic sustainability concerning the direct, indirect and externality benefits of tourism (e.g., Farid, 2015; Gisselman et al., 2017).

This study departs from traditional discourse by focusing on the relationship between world heritage sites with OUV and property market values, rather than on the decision-making process of OUV and the inscription cultural sites in the WHL. The main motivation for taking this approach arises from Meskell's (2013) study, which describes how the WHL inscription of heritage properties with OUV has become much more closely aligned with its transaction potential than its conservation values. Accordingly, Kenterelidou and Galatsopoulou (2021:03) state, '*Being included in the World Heritage List of UNESCO raises the site's profile and brings resources*,' such as economic revenues from the global marketplace and real estate market (Foo and Krishnapillai, 2019; Meskell, 2013). Yet, as Kenterelidou and Galatsopoulou (2021) detail, for too long there has been no or little research conducted on the understanding of the socio-economic development and use benefits of heritage sites with OUV inscribed on the WHL (detailed in Section 3). As of 25 April 2022, 194 state parties have ratified UNESCO's WH Convention, with a total of 1,154 listed sites inscribed on the WHL across 167 countries. Of these, 218 are natural sites, 897 are cultural sites and 39 are mixed sites, including Old Rauma in Finland, the focus of this study (Section 4).

In view of the above, this study builds on upon Devaux et al.'s (2018) insights while also advancing the work of previous studies on the impact of heritage listing and designation on property market values within national and/or local boundaries (e.g., Andersson, et al., 2019; Armitage and Irons 2013; Bertacchini and Saccone, 2012; Fernandez and Martin, 2020; Franco and Macdonald, 2018; Gale, 1991; Heintzelman and Altieri, 2013; Heudorfer, 1975; Winson-Geideman and Jourdan, 2011; Oba and Noonan 2017; Samuels, 1981; Zahirovic-Herbert and Gibler, 2014) by focusing on WHS. Studies in the area of the heritage economics until now with the exception of Devaux et al. (2018) have, perhaps unexpectedly, tended to leave aside heritage sites inscribed on the WHL. This study is also motivated by the desire to understand the economic value that a UNESCO heritage listing bestows on the residential property market. As Meskell (2013: 492) notes, '*UNESCO* [is a] *fascinating topic* . . . [it] *offers a powerful lens into potential of something called heritage in political cultural, economic and spiritual terms.'* As such, the present study develops that of Devaux et al. (2018), Kenterelidou and Galatsopoulou (2021) and Oba and Noonan (2017) by offering insights relying on economic modelling using sales price data sources as measure of the impact of WHL on property market values.

3. The Values of World Heritage Sites

Scholarly research on the impact of WHL on property market values remains limited, although academic publication on local/national heritage designation has grown. The purpose of the current study is to shed light on the impact of WHL of OUV on residential property market values. As discussed in the previous section, much of the research into UNESCO's heritage listings is built on the notion that heritage assets have values that make an outstanding contribution to the global community. Before proceeding further with the concept of WHL, it is essential to clarify what is meant by the term 'values,' as this dictates the assessment procedures for the identification, documentation, designation/listing and management of heritage sites (Avrami et al., 2019). The most used definition of values in the heritage context is '*a set of positive characteristics or qualities perceived in cultural objects or sites by certain individuals or groups*' (De la Torre and Mason, 2002:04). The broader stream of literature on cultural heritage has identified numerous values attached to the authenticity and integrity of heritage sites (Australia ICOMOS, 2013; ICOMOS, 1994; Riegl, 1903[1998]), with considerable attention paid to the evolutionary dynamics of value typologies, as detailed in Fredheim and Khalaf (2016: 468) and the shift towards the dimensions of sustainable development (e.g., Carver, 1996; Janssen et al., 2017; Lipe, 1984; Nocca, 2017).

The main point to take from the heritage literature is that people will ascribe values to heritage sites depending on the perceived benefits gained from their protection (Amar, 2017; Avrami et al., 2019; De la Torre and Mason, 2002; Smith, 2006). According to Throsby (2007), there are two broad categories of the values of heritage properties (including sites): collective values and individual values. *Collective values* place emphasis on the social meanings associated with the heritage object/site – i.e., a sense of identity, belongingness and spirituality – as the embodiment of a community's public interests (Jones, 2017). For example, appending a sauna to real estate in Finland symbolises the tradition of togetherness, equality and spirituality existing in Finnish culture; however, sauna bathing is not significant in other Scandinavian countries (Gannon and Pillai, 2010). In other words, such social meanings define the public interests for the protection of cultural sites at the international, national and regional or local

levels (Díaz-Andreu, 2017). In 2020, UNESCO added Finnish sauna culture to the Representative List of the Intangible Cultural Heritage of Humanity.

Individual values are the specific utilities or benefits accrued from the consumption of heritage sites tied to heritage economics where private interest prevails (Throsby, 2007). Heritage economics has gained widespread attention, particularly in the last three decades, as arguably the most important component to emerge in the economics and heritage conservation literature (Amar, 2017; Benhamou, 2020; Throsby, 2003; Peacock, 1995). In the edited volume *Values in Heritage Management: Emerging Approaches and Research Directions* (Avrami et al., 2019), three types of individual values that may influence the protection of heritage sites are identified. These are defined as follows:

- *Use values* are derived from the direct consumption of heritage sites as a private good (e.g., residential and commercial) or service (e.g., tourism) traded for premium market values (i.e. rental and sale) or visitor entrance fees in the market process due to values attached to heritage properties. For example, Witt (2019) found that visitors to WHS in Mexico were willing to pay up to US$18.02 more than the current entrance fees of the case study sites, and Conti (2019) reported that monuments like the Royal Palace at Caserta, Naples, which is inscribed on the WHL, are rented for private events.
- *Non-use values* are indirect benefits generated from the willingness to acquire and/or safeguard heritage sites to obtain (i) existence value – the satisfaction that such places exist for others to use (Dana, 2004); (ii) option value – happiness that others have an option to access heritage sites for their enjoyment (Klamer, 2014); and (iii) bequest value – contentment that the site is bestowed for future generations (Rojas, 2012). A good example of the nonuse value of heritage sites is when the French heritage lottery raised around 20 million euros from selling 2.5 million tickets for the restoration of 269 endangered sites in 2018 (Wemaëre, 2018). The United Kingdom's Heritage Lottery Fund is another example of a longstanding contributor to heritage research and conservation projects that are seen to be beneficial to a society (e.g., Mitchell and Colls, 2020).
- *Beneficial externality,* also known as spillover, contributes to the economic well-being of individuals or the broader society as a result of the protection of heritage sites. Several studies have presented varied findings on the impact of heritage listing and designation on property market values (Armitage and Irons, 2013). Some found positive effects; for example, Franco and Macdonald (2018) found conservation areas yielded 4.1% premium with a spillover benefit of 3.3% in Lisbon, Portugal and Zahirovic-Herbert and Gibler (2014) reported that heritage properties attracted a 5% premium on sale price in Baton Rouge, USA. Some found negative effects; for example, Heintzelman and Altieri (2013) reported local historic districts reduced market prices by 1.6% to 15.5% of properties within a district in Boston, USA, whilst Fernandez and Martin (2020) found the premium in Special Character Areas in Auckland, New Zealand decreased to 4.3% in 2016 from 11.4% in 2012. Others found neutral results; for example, Winson-Geideman and Jourdan (2011) observed no significant impacts of preservation easements on market value of homes in the City of Savannah, USA, and Oba and Noonan (2017) noted local designations exhibited no consistent price impacts on properties inside historic districts in Fulton County, USA – confirming findings of earlier studies Gale (1991), Heudorfer (1975) and Samuels (1981) that showed neutral impacts of heritage designation on property values (discussed later in Section 6).

It should be noted, however, that the market values of properties within a heritage-listed or designation area are sensitive to the quality of the neighbourhood (e.g., amenities, security) and are reflective of value-enhancing factors (e.g., cultural aesthetics, financial incentives) or value-reducing factors (e.g., maintenance costs and redevelopment restrictions). As such, Franco and Macdonald (2018) state that it is necessary to understand how people perceive the value of heritage sites to be able to effectively design conservation policies and manage their protected status. Oba and Noonan (2017), however, emphasise that the analysis of values of heritage sites under different and overlapping preservation policies will provide a robust understanding of the relationship between private property rights and the effectiveness of historic designation programmes. Anderson et al. (2019) reveal that the classification of heritage sites in the Halland's (Sweden) major metropolitan areas affects the premiums of the sale price, ranging from 36 to 60% for Class A, 19% Class B and Class C is around 3 to 5%, while cultural spillover to buildings in vicinity of Class A at 1%.

So far, existing studies in heritage economics have assessed the relationships between property values and heritage listing and designation at either the national level, the local level or a mix of national/local levels. Furthermore, using different valuation methods, previous studies have shown that the use, non-use and beneficial externality of heritage listing and designation impacts property values variously – positively, negatively or neutrally. These methods include the hedonic pricing model, travel costs model and stated preference model in contingent valuation. This study builds on previous research (e.g., Devaux et al., 2018; Kenterelidou and Galatsopoulou, 2021; Oba and Noonan, 2017), as well as, the somewhat dated Gale (1991), Heudorfer (1975) and Samuels (1981) and focusses on beneficial externality by analysing the impact of UNESCO heritage listing on residential market values in the City of Rauma using the hedonic pricing model. However, it is not seeking to assess the impact of OUV, *per se*, on residential property values irrespective of world heritage designation.

4. The case of Old Rauma, Finland

At present, there are seven WHL sites in Finland. One is a natural site called Kvarken Archipelago and six are cultural sites, one of which is Old Rauma, which was inscribed in 1991. Old Rauma is situated on the Gulf of Botnia in Western Finland (UNESCO, n.d) and covers an area of 29 hectares, which is divided into 46 blocks in a community of around 800 residents (Caruso and García-Soriano, 2020; Haanpää et al., 2019; UNESCO, n.d.). According to Haanpää et al. (2019), the Old Rauma WHS has 600 buildings constructed of wood, which include 250 residential, 100 commercial and 240 outbuildings, with the remaining being public buildings. All of these are built heritage.

Laurila and Paavo-Koponen (2020) mention that while many of these buildings still function as originally intended, some have undergone adaptive reuse to match evolving urban lifestyles and vibrancy. Despite being ravaged by fire in 1682, these buildings nevertheless retain their vernacular wooden architecture (Figure 1). Similarly, Dumitrescu (2016) presents that the urban features of Old Rauma have been well preserved, resulting in an intact townscape (city blocks, plots) and irregular streetscape (including yards and entrances) evident since Nordic medieval times (Figure 2).

Figure 1: Left – The Nordic vernacular architecture in Old Rauma, Finland (Carlander, 2016). Right – New buildings adjacent to the world heritage designation of Old Rauma (Kallerna, 2020)

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Figure 2: Old Rauma Town plan structure (UNESCO World Heritage Centre, 2009)

As such, Old Rauma was recognised as an essential part of the local cultural heritage in the 1960s and '70s, leading to the establishment of the Old Rauma Society in 1974 to conserve its unique traditional urban structure, architectural aesthetics and wooden building methods (Haanpää et al., 2019). Prior to this, Ehrström et al. (2015) note that Old Rauma's built heritage was in poor condition, resulting in calls for town plan renewal. The demolition of the historic buildings was proposed to pave the way for contemporary residential and commercial buildings. However, due to heritage enthusiasts and residents campaigning for the preservation of the Old Rauma built heritage, the outcome was a rejection of demolition, despite weak national preservation legislation (Vahtikari, 2016). This marked the model for projects in the urban conservation of traditional wooden settlements in Northern Europe, with Old Rauma chosen as an exemplar of 'Nordic Wooden Town' projects (Kalakoski et al., 2020). Following this, the municipality, together with six local associations, established the Old Rauma Foundation in 1976 for further protection of the built heritage, as detailed by Haanpää et al. (2019). The foundation's role has been to facilitate the preservation of the wooden town through conservation plans and incentives.

The conservation actions of the residents, municipality and planning authorities led to the adoption of the 1981 Town Plan Amendment that consolidated the preservation of the values attached to Old Rauma's built heritage. Scholars have different views of the success of the Amendment. On the one hand, Dumitrescu (2016) states that replacement of Old Rauma

heritage declined due to the restoration and remodelling of historic buildings characterised as otherwise unsuitable for use. On the other hand, Vahtikari (2016) specifies that the Town Plan Amendment guidelines proposed that buildings unsuitable for Old Rauma's built heritage – stone structures such as large-scale industrial buildings and warehouses – be replaced with small wooden buildings to represent the authenticity of wooden town typologies. This conservation practice created a balance between protecting the authentic qualities of Old Rauma's built heritage with its long-term continuation of wooden town life, including residential use and flourishing commercial and services functions (Dumitrescu, 2016; Haanpää et al., 2019; Laurila and Paavo-Koponen, 2020; Vahtikari, 2016). Concurrently with the conservation efforts, Old Rauma was nominated as a UNESCO protected site in 1990 by the Finnish nomination dossier organised in the 1970s and '80s, which documented the historic town features that played a significant role in European urbanisation (Dumitrescu, 2016).

In 1991, the World Heritage Committee inscribed Old Rauma on the WHL as a Nordic wooden town representative of the '*most expansive examples of the northern European architecture and urbanism*' (criterion iv) and a well-preserved '*history of traditional settlements in northern Europe'* (criterion v). ICOMOS assessed that the cultural site possesses outstanding universal value because of its 'living' commercial, residential and services area. These two criteria are prerequisites for UNESCO protection (Haanpää et al., 2019; Kalakoski et al., 2020; UNESCO, n.d.). This means that local and national heritage practices for the conservation of Old Rauma's historic fabric were refined to correspond with the expanding international guidelines such as the establishment of a buffer zone around Old Rauma (Sonkoly and Vahtikari, 2018). The conservation practice of this WHS is undertaken in two ways (Dumitrescu, 2016; Haanpää et al., 2019; Laurila and Paavo-Koponen, 2020): local administrative bodies are involved in safeguarding privately owned built heritage and maintaining the diversity and liveability of Old Rauma; and joint management between national authorities (The Finish Heritage Agency and ICOMOS Finland) manages the conservation and development goals of Old Rauma, including its buffer zones, without jeopardising the authenticity and integrity of the cultural fabric.

The management of the Old Rauma WHS has melded aspects of intangible components with tangible heritage to achieve social, economic and environmental suitability in its built heritage (Haanpää et al., 2019; Sonkoly and Vahtikari, 2018). Intangible heritage components include '*specific traditions, cooking, dances, occupations, processes associated with human life in general*' (Dumitrescu, 2016:14). As mentioned previously, the most notable example of a specific tradition related to this study is the Finnish sauna culture, which is part of the UNESCO's Representative List of the Intangible Cultural Heritage of Humanity in 2020. It is reported (Bosworth, 2013; Dumitrescu, 2016; Palander, 2015; United Nations Regional Information Centre [UNRIC], 2020) that this intangible culture almost disappeared at the end of the 20th century but, following the revival of sauna practice by private initiatives, has remained a key part of the Finnish built heritage and architecture for both private and public buildings. UNRIC (2020) states that, in Finland, there were approximately 3.3 million saunas and a population of 5.5 million, 90% of whom used a sauna once a week.

To summarise, heritage stakeholders are seeking to preserve the authenticity of the Old Rauma WHS because of the benefits accrued from the consumption of and opportunities derived from managing its tangible and intangible heritage components. Moreover, considering that its 600

heritage buildings are mostly in private ownership (UNESCO, n.d.), with more favourable attitudes toward values of cultural heritage tradable in a market (e.g., Avrami et al., 2019; Mason, 2008; Throsby, 2003), a further study of effects of heritage designation on property values is warranted. Whilst this study is similar to previous heritage economics studies in terms of its methodological approach (Section 4) (e.g., Andersson, et al., 2019; Fernandez and Martin, 2020; Franco and Macdonald, 2018; Heintzelman and Altieri, 2013; Winson-Geideman and Jourdan, 2011; Oba and Noonan 2017; Zahirovic-Herbert and Gibler, 2014), it differs in terms of the heritage listing level: the focus being on a world heritage site rather than local and national heritage sites.

5. Methodology

5.1 Property Value Data

This study uses residential sales transaction data from the City of Rauma from January 2005 to September 2012 (hereinafter referred to as *the dataset*) drawn from an online database called *KVKL Hintaseurantapalvelu* managed by the Central Federation of Finnish Real Estate Agencies. According to Tyvimaa and Kamruzzaman (2019), *KVKL Hintaseurantapalvelu* records approximately 80% of housing transactions made by companies and agencies operating in the Finnish housing market each month.

The original dataset downloaded from *KVKL Hintaseurantapalvelu* consisted of 1,800 sale transactions of WHL and non-WHL designated residential properties in the City of Rauma. However, after reviewing the list of property characteristic variables in the original dataset, 34 transactions were not taken into account in this study because they were missing one or two variables of interest. The variables of interest include (but are not limited to) sale prices (euros/sqm and total prices), transaction dates, property features (such as living area and number of rooms, number of storeys in a multi-storey building, condition of the property), location (X-coordinate and Y-coordinate), and legal interests related to freehold or leasehold land ownerships.

The resulting dataset contained a total sample of 1,766 transactions for analysis (see Table 1), of which 41 transactions were completed in the Old Rauma WHS. Dumitrescu (2016), Haanpää et al. (2019) and Laurila and Paavo-Koponen (2020) all note that both national and local administrative bodies, including heritage enthusiasts and residents, exhibit a strong desire to preserve the Nordic town.

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Table 1 Variable definitions and sample summary statistics

In general, the dataset summarised in Table 1 indicates that the age of the properties when the sale took place ranged from less than one year old (very new) to just over 300 years – representing properties that survived the major 1682 fire and are now part of the Old Rauma WHS – with mean average of just under 35 years. The most common heights observed during the analysis were four storeys for non-WHL designated residential properties and two storeys for WHL designated residential properties. Dumitrescu (2016) explains that these can be

viewed in parallel with the provisions of the Buildings Ordinances adopted in 1823 and the 1960's contemporary move to introduce multi-storey buildings into Finnish historic towns, including Old Rauma.

Table 1 also shows that WHL designated properties are, on average, generally larger in size (100.84m^2) than non-WHL designated properties (68.58m^2). The average selling prices per square metre are 1,615.43 euros for WHL designated properties and 1,586.44 euros for non-WHL designated properties between January 2005 to September 2012. Hence, the lowest and highest total sale prices for residential properties have a mean of 144,523 euros for WHL designated properties and 106,197 euros for non-WHL properties. In the dataset, 63% of sold WHL designated properties were in good condition at the time of sale, which is nearly the same as non-WHL designated properties (64%), indicating that residents take good care of WHL designated properties.

The analysis of the dataset found that 39% of non-WHL designated properties and 27% of WHL designated properties had private saunas. Palander (2015) and Tyvimaa and Kamruzzaman (2019) demonstrate very clearly that saunas are a preferred amenity in the Finnish housing market, whether attached to private or public properties, resulting in saunas being added to the UNESCO's List of the Intangible Cultural Heritage of Humanity status. Since the City of Rauma has one postcode as a geographic identifier, the study used three locational variables to measure the closest distances to public places from each residential property. These are the seacoast, representing the Port of Rauma (commercial harbour), a public beach and the town square of Rauma at the centre of the Old Rauma WHS. Similarly, the analysis controlled the time of the sales by employing sets of dummy variables describing the month of a sale and the year of a sale.

5.2 Analytical Strategy

The study uses the hedonic price model, which was initially developed by Lancaster (1966) and later refined by Rosen (1974), to estimate empirically the difference in prices for residential properties located in the Old Rauma WHS. Generally speaking, these theories investigate how numerous attributes of a good, when combined, form bundles of desired characteristics that the consumer values in a specific market. It is not the purpose of this study to review Lancaster (1966) and Rosen (1974); however, as discussed by Waddell (2000), the two theories are tools for urban and property market analysis. In fact, the application of Lancaster's (1966) and Rosen's (1974) theories relates to the underlying characteristics of each residential property that must be individually examined to determine the overall value of the dwelling to the consumer.

Within the current study, hedonic price models represent a way to estimate the implicit marginal prices of these differentiated characteristics of the real property. The partial derivative of a hedonic function with respect to any attribute is the implicit marginal attribute price, *ceteris paribus*. This implicit price of the housing attribute is revealed in the regression coefficient. Then, the price of the residential property is the sum of the implicit prices for the attributes that are contained within it. Thus, the hedonic price approach enables the possible influence of each of the many attributes of the residential property price to be tested and analysed.

In general, when adapted to the housing market, such models specify the sales price of a residential property as being a function of a vector of the structural characteristics of the unit and the property, *S*; a vector of location or neighbourhood accessibility characteristics, *N*; and time trend variables representing fixed effects for the year and month of sale, *F*. In this study, the variable of interest representing whether a residential property is in WHL are isolated, where c is the regression constant and ε the error. Hence:

$$\ln(Price) = c + \alpha S + \gamma N + \varphi F + \beta UNESCO + \varepsilon$$

The log-linear specification, which is the most frequently used method for hedonic modelling, allows the coefficient of a dummy independent variable (located at the WHL) to be interpreted as the percentage change in the dependent variable (residential property price). The study presents two models: Model One is a baseline hedonic estimation on the full sample and Model Two includes the independent dummy variable if the sales transaction is within the WHS.

6. Results

The present study builds on previous recent research (e.g., Devaux et al., 2018; Kenterelidou and Galatsopoulou, 2021; Oba and Noonan, 2017; Winson-Geideman and Jourdan, 2011), as well as the much older Gale (1991), Heudorfer (1975) and Samuels (1981), by offering insights employing economic modelling of sales price data as measure of the impact of WHL on property market values. Choosing a UNESCO heritage-listed site as a case study (refer to Section 4), this paper focuses on beneficial externality, as described previously (Section 3), and analyses the impact of world heritage designation on residential property values. UNESCO is the leading global institution which deals with the protection of heritage sites that transcend national and local boundaries. This study is the first one to analyse residential property values in a UNESCO heritage-listed site.

The analysis involved the estimation of the log of transaction prices per square metre in euros (deflated to 2000) as the dependent variable using an ordinary least squares (OLS) regression to analyse the value (increased or decreased) of WHL designated properties. As shown in Table 2, the structural characteristics included as independent variables are the AGE of the residential properties in years along with AGESQUARED; a dummy variable indicating whether the residential property contains a private SAUNA; FLOOR where the unit is located and TOTALFLOORS indicating number of floors in the building; number of ROOMS in the residential property; and SIZE of the residential property in square metres along with SIZE-SQUARED. Unfortunately, some variables of interest, such as property renovation and alteration, are not available in this dataset. Thus, GOOD and POOR are used as dummy variables to indicate the real estate agent's evaluation of the property condition as good, average or poor.

For all transactions, RENTALLOT is a dummy variable that is applied to indicate whether the property falls under leasehold or freehold tenure. MULTIFAMILY is a dummy variable that indicates whether the residential property is in a multi-storey building. NEW SALE is a dummy variable for the transactions sold for the first time by developers whose prices are non-negotiable. Distance to the town centre of Rauma and the main square of Old Rauma

(DISTSQUARE) is measured in kilometres from point to point. Other distances are to the Port of Rauma (DISTHARBOUR) and distance to the main public beach (DISTBEACH). Fixed effects for year and month of sale are obtained using sets of dummy variables. The results are provided in Table 2.

Insert

Table 2 The summary of results

The study found a positive but insignificant relationship between world heritage designated properties and selling price (euros/sqm). WHL designated properties sold for a higher total sale price than non-WHL designated properties in the City of Rauma. In this analysis, however, world heritage designation has a neutral impact on properties' values in the City of Rauma because WHL designated properties are significantly larger than in the non-WHL designated properties, which leads to higher total selling prices. This result is consistent with three of the earlier comparative studies on the impact of historic districts on property values, Gale (1991), Heudorfer (1975) and Samuels (1981), and two recent study, Oba and Noonan (2017) and Winson-Geideman and Jourdan (2011).

Gale (1991) reported no evidence of property value increase within historic districts post designation in Washington, USA. Heudorfer (1975) found that even though properties located in historic districts in New York City, USA, sold at a premium before and after heritage designation, the status of heritage listing in itself had low or insignificant influence on property values. Samuels (1981) concluded that the 1972 to 1978 residential sale prices within the study areas indicated a similar growth rate of property values in Washington's historic and non-historic districts, USA. In line with these results, Oba and Noonan (2017: 230) reported no significant price effects inside local designation in Atlanta, USA, and that '*stronger preservation policies may not have stronger price effects*'. The study finding also generally confirms the observation of Winson-Geideman and Jourdan (2011) that the market value of historic preservation easements placed on residential properties is not significantly affected when compared to unencumbered residential properties. Therefore, the current study supports previous findings that stronger preservation policies, such as the UNESCO world heritage policy adopted in this study, have no price effects on residential properties. This process has contributed to the literature by expanding the significance of the heritage listing from local and national designation to global identification.

All other variables are statistically significant at the level of 1%. The number of rooms, the age of the building, the floor level where the unit is located and the condition variables are aligned with the results of previous property studies in Finland (Eerola and Lyytikainen, 2015; Tyvimaa and Kamruzzaman, 2019; Tyvimaa et al., 2015). The variable TOTALFLOORS sells for a premium, which contradicts previous Finnish studies (see Tyvimaa et al., 2015) which found that residential properties in high-rise buildings sell for a discount in comparison to those in low-rise residential buildings. However, this can be explained by the fact that the City of Rauma has a predominantly medium-rise profile with the tallest buildings having a maximum of eight levels.

In Old Rauma, residential properties with a private sauna sell for significantly more (at 19% of market price) than those without saunas. This finding is similar to some other previous research on the Finish residential markets (i.e., Tyvimaa et al., 2015), which also reported that the properties with saunas in the City of Helsinki sold for 8% higher than those without saunas. Although both studies show a positive relationship between saunas and property market values, the 11% variation in the sale price might be explained by cultures in norms relating to geographical location – private saunas are more common in rural areas and smaller towns than in capital cities, where public saunas are more prevalent. In this sample, nearly 40% of apartments have a private sauna, while in the sample from Helsinki only 11% of apartments have a private sauna (Tyvimaa et al., 2015), with public saunas more common in Helsinki than in the City of Rauma. Historically, as detailed by Dumitrescu (2016), the number of public saunas is small in Rauma, with only seven listed on the City of Rauma's official website.

7. Conclusion

Studies in the field of heritage economics have assessed the relationship between property value, heritage listing and designation at either the national level, the local level or a mix of national/local levels. These studies have shown mixed results (positive, negative or neutral) of heritage listing and designation on property market values. This paper contributes to the literature by choosing a UNESCO heritage-listed site, as UNESCO is the leading global institution which deals with the protection of heritage sites which transcend national and local boundaries. The Old Rauma World Heritage Site, one of the oldest wooden towns in Europe, was used as a case study.

This analysis indicates no significant difference in the sale price (euros/sqm) between WHL designated and non-WHL designated properties. However, the WHL designated properties are larger in floor area, which leads to higher total selling prices and the perception that WHL designated properties are more expensive. One of the limited studies focusing on Old Rauma is a master's thesis (Taipale, 2018) where the author interviewed residents living in Old Rauma. This report discusses the residents' commitments, their lifestyles and the shared community. The residents' experience is part of the town's history and they describe living and owing a property in Old Rauma as a privilege. The residents are proud of living in Old Rauma. The report also mentions that properties in Old Rauma are expensive. The statement is not supported by valuation but by the residents' interviews where the opinion may be formed based on higher total prices (as the properties are larger) and the commitment to take care of historical assets (renovation and maintenance costs).

This study is limited to the impact of UNESCO world heritage-listed properties in a small Finnish town. To further advance this study, it would be also interesting to compare the results from the study's *KVKL Hintaseurantapalvelu* dataset for Old Rauma from 2007-2012 and compare the results over the 10-year period from 2013. Also, future research is needed to examine the influence of renovations on historic properties and further research should be considered to estimate explicitly the price effects of heritage listed buildings, along the line of national versus WHL designated comparative analysis.

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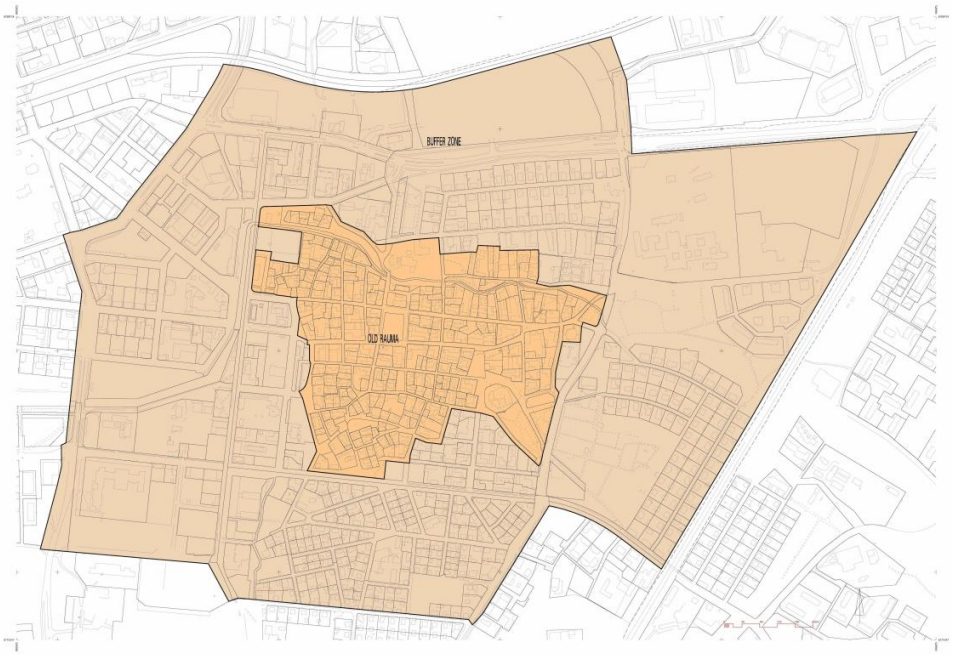

Figure 2: Old Rauma Town plan structure (UNESCO World Heritage Centre, 2009)

586x400mm (200 x 200 DPI)

Table 1: Variable definitions and sample summary statistics

		Full sample		World Heritage Listed		Non-World Heritage Listed		Difference in means t-test
Variables	Description	Mean/ Percentage	SD	Mean/ Percentage	SD	Mean/ Percentage	SD	
PRICESQM	Sale price in Euros per square metre	1,587.11	643.42	1,615.43	478.14	1,586.44	646.92	43.5547
PRICE	Total sale price in Euros	107,086.40	61,375.42	144,523.20	77,029.75	106,196.60	60,702.01	41.1893***
AGE	Age of the building at time of sale (yrs)	34.57	26.98	117.1707	69.10	32.60	21.64	40.1866***
FLOOR	Floor on which unit located	2.58	1.59	1.56	0.78	2.61	1.60	48.4433***
TOTALFLOORS	Number of floors in building	4.03	2.08	1.71	0.90	4.09	2.07	50.6378***
SIZE	Size of the unit (sm)	69.33	34.45	100.87	88.25	68.58	31.79	40.2471**
ROOMS	Number of rooms in unit	2.55	1.12	2.76	1.36	2.54	1.11	41.2863
CONDITION	Good (1=yes)	63.82%	0.48	63.41%	0.49	63.83%	0.48	41.868
	Average (1=yes)	38.77%	0.48	34.15%	0.48	34.78%	0.48	41.8938
	Poor (1=yes)	1.42%	0.12	2.44%	0.16	1.39%	0.12	41.0772
SAUNA	Private sauna in unit (1=yes)	38.39%	0.49	26.83%	0.45	38.67%	0.49	42.273
MULTIFAMILY BUILDING	Unit located in a multistorey building (1=yes)	77.29%	0.42	24.39%	0.43	78.55%	0.41	41.7134***
NEW SALE	Dwelling sold as a new development (1=yes)	16.48%	0.37	NA	NA	16.75%	0.37	NA
RENTALLOT	Building on leased lot (1=yes)	35.73%	0.48	4.88%	0.22	36.46%	0.48	49.7889***
DISTHARBOUR	Distance to the sea coast (km)	2.05	0.78	2.44	0.19	2.04	0.78	79.8829***
DISTSQUARE	Distance to the city center (km)	1.07	0.55	0.30	0.13	1.09	0.55	81.9316***
DISTBEACH	Distance to the public beach (km)	1.88	0.76	2.34	0.22	1.87	0.76	66.0375***
Observations		1,766		41		1,725		

VARIABLES	Model 1 Full sample lnSQPRICE	Model 2 Full sample lnSQPRICE
UNESCO		0.0723
		(0.0554)
AGE	-0.0055***	-0.0055***
	(0.0007)	(0.0007)
AGESQUARED	0.0000***	0.0000***
	(0.0000)	(0.0000)
SAUNA	0.1877***	0.1875***
	(0.0176)	(0.0176)
FLOOR	0.0250***	0.0249***
	(0.0041)	(0.0041)
TOTALFLOORS	0.0139***	0.0146***
	(0.0042)	(0.0043)
SIZE	-0.0068***	-0.0067***
	(0.0008)	(0.0008)
SIZESQUARED	0.0000***	0.0000***
	(0.0000)	(0.0000)
GOOD	0.1253***	0.1242***
	(0.0123)	(0.0123)
POOR	-0.1381***	-0.1369***
	(0.0448)	(0.0449)
ROOMS	0.0450***	0.0440***
	(0.0124)	(0.0124)
RENTALLOT	-0.1088***	-0.1079***
	(0.0122)	(0.0122)
MULTIFAMILY	-0.2841***	-0.2811***
	(0.0228)	(0.0228)
NEWSALE	0.1421***	0.1402***
	(0.0238)	(0.0239)
DISTHARBOUR	0.2300***	0.2299***
	(0.0220)	(0.0220)
DISTSQUARE	-0.1169***	-0.1128***
	(0.0113)	(0.0115)
DISTBEACH	-0.2453***	-0.2470***
	(0.0222)	(0.0223)
TIME CONTROL (month and year)	YES	YES
Constant	7.5623***	7.5543***
	(0.0597)	(0.0587)
Observations	1,766	1,766
R-squared	0.6788	0.6793

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1