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The economic performance of heritage cities in Brazil

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Summary

Historically relevant areas within the built environment are often neglected by those who hold a stake in development processes in Brazil. A major argument regards the understanding of protecting properties and urban areas as a hindrance for current economic needs. However, existing literature mainly show compelling evidence that heritage conservation activities and effects may, in reality, favour the economic development of cities. Furthermore, governance factors may determine such outcomes from heritage. These are not sufficiently assessed in developing countries, which includes Brazil. Through multiple regression analyses using secondary data of 5,530 out of the 5,570 Brazilian cities and a correlation analysis using primary data provided by municipal officers, this research aims at obtaining a broad picture of economic development and management of heritage cities. It has identified a positive relationship with gross domestic product (GDP), income and jobs. The predominance of touristic activities remains, however other important sectors contribute to the results. Surprisingly, public revenue is lower in heritage than in non-heritage cities, to a certain extent mediated by the also lower number of attracted investments. Regarding types of firms, an on-going structural change is perceived, as primary sector firms are fewer and creative firms are found more frequently in heritage cities, while the mean number and size of firms are intermediate compared to non-heritage cities. An important moderating and mediating factor is the share of the higher educated population: It is larger in heritage cities, which in turn influence economic outputs. The most prioritized strategy by local governments is currently city marketing, perhaps as a reaction from the weak performance in that sense. Also highly prioritized, integrating the heritage areas into holistic urban development plans has shown to positively relate to economic indicators; However, stricter land regulations have rarely been applied. The main challenges for local managers are insufficient finance resources, related to low prioritization of such areas, conflicting interests by stakeholders and often problematic interaction within different levels of government. Interestingly, the lack of political willingness relates positively with investments attractiveness, which may imply that areas outside the protected boundaries have been prioritized by local politicians.

Keywords

Heritage areas; Economic performance; Governance

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Abbreviations

IHS	Institute for Housing and Urban Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
IPHAN	National Institute for Historical and Artistic Heritage
ICOMOS	International Council on Monuments and Sites
OUV	Outstanding Universal Value
IBGE	Brazilian Institute of Geography and Statistics
IPTU	Brazilian abbreviation for urban land tax
R$	Brazilian reals
GDP	Gross Domestic Product

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Glossary

Conservation: maintenance of adequate conditions through a series of actions (Throsby, 2012).

Designation: the act of officially classifying an asset and assigning it a title.

Preservation: assurance of permanent existence of an asset (Throsby, 2012).

Protection: guarding an asset to avoid harms.

Liveability: the combination of economic prosperity, cultural vibrancy, recreation opportunities and other factors that enhance the quality of life in cities.

Urban heritage ensemble: also referred to as heritage area, meaning a delimited area within the urban environment that is object of conservation by protection policies

Heritage city: in Brazil, it refers to a city that has an urban area designated for conservation by IPHAN.

Chapter 1: Introduction

"Cities that are the most successful at attracting investments and businesses to meet the aspirations of their citizens, while alleviating poverty and promoting inclusion, are those who harness all of their resources, including their heritage. In addition, heritage anchors people to their roots, build self-esteem, and restores dignity. Identity matters to all vibrant cities and all people."

- Rachel Kyte, Vice President, Sustainable Development Network. The World Bank.

1.1 Background

Economic development is currently the principal justification for accelerating urbanization in developing countries. Such process exerts pressure on heritage areas, ultimately vanishing culture and history within the built environment (Sandholz, 2017, Rama, 2012). This phenomenon is also perceived in Brazil, where cities grow in a decentralized trend, privileging the sprawl and the fragmentation of the urban fabric (Cravidão, Fernandes, et al., 2012) and, consequently, discouraging investments in historical city cores. Although a growing trend in recognizing historical values has been observed, cultural heritage is still rarely positioned as an asset that can contribute to economic development. For this reason, this thesis aims at understanding the economic effects of heritage ensembles conservation.

The arguments for conserving the built heritage have been evolving during the past centuries. The principle rationale is related to history and identity. Historical value is intrinsic to buildings and collective spaces that hosted remarkable events or were simply part of the origins of a society, thus their conservation creates symbols that are connectors with the past, builders of authentic identities and subject to scientific knowledge. Throsby (2012) highlights the necessity of maintaining what is relevant from the past, enabling it to be part of the future, and adopts the precautionary principle to compare culturally relevant buildings to endangered species in nature, stressing the impossibility of replacing a historical building due to the specific context's uniqueness that shaped its physical outcome. Also, in this regard, construction features that represent a specific period in the history of architecture lead to the decision of conservation. Next to that, outstanding aesthetic value may be the reason for conserving historical structures, that display beauty in isolation or within a favourable landscape (Rojas, 2016).

UNESCO (2016) positions the appreciation and conservation of urban identity, local cultures, arts and heritage as cornerstones of sustainable development, and as means of resisting to the transformation pressure of the increasing metropolitan character of the world. Such forces enhance creativity, attractiveness, and are especially necessary to leverage social cohesion and social capital (Rypkema, Cheong, et al., 2011, Throsby, 2012, Rojas, 2016). In a similar approach, several countries adopt the values of bequest and existence of heritage for people as the rationale for conservation (Rojas, 2016). Furthermore, community engagement is argued to be encouraged and improved by placing culture as a foundation for urban strategies, and cultural exchange constitutes a qualitative valuation for heritage conservation (Zetti, 2010, Nijkamp, 2012, Monteiro, Painho, et al., 2015, UNESCO, 2016). Additionally, the conserved heritage facilitates the understanding of past decisions, steering future generations to act towards just cities (Goransky, 2015). Argued to be as relevant as social identity or aesthetic reasons, psychological arguments build upon the importance of the fixed existence of the past within the built environment. It is argued that conserved heritage act as a "symbol of stability"

(Larkham, 2002, p. 5), providing a point of reference with sense of belonging and security that supports humans throughout daily life (Grenville, 2007).

A recent approach adopts environmental values as the argument for conservation. Rypkema (2011) argues for preserving and rehabilitating heritage areas rather than demolishing and rebuilding structures, by assessing avoided impacts, such as savings in infrastructure, the building's embodied energy and land that is not developed. Similarly, an extensive study by Frey (2011) compared impacts of new developments with rehabilitation, with regards to resources, materials, energy efficiency, carbon emissions and accounting for various types of use. Both authors showed a decreased contribution from the construction sector to climate change when buildings were adapted for reuse, reinforcing the environmental argument.

The acknowledgement of the cultural, historical, social, ecological and psychological values of heritage is determinant to create and expand the agreement of conservation among different actors (Rojas, 2016). However, economic aspects are often the ultimate determinant to decisions made within the contemporary, neoliberal world. The attribution of economic values to historical buildings and ensembles is conducted using an array of approaches. The economic use value of protected built areas largely relates to the capacity of adaptation of such assets. In this case, it is understood that historical structures can provide support for contemporary uses, allowing for the participation of the private sector, mainly related to real estate (Rojas, 2016). Studies frequently adopt measurements of jobs creation, change in household income, increase in property values and commercial vibrancy, and show that such activities are enhanced by heritage-led revitalization processes (Rypkema, et al., 2011). Additionally, a considerable return from investments in historical areas is perceived in the economic structure of cities, enhancing knowledge-based industries, such as cultural and creative activities, services and tourism. The latter is largely associated with heritage conservation in developing countries, favoured by the vibrancy stemming from hotels, bars, restaurants and events (Throsby, 2012, Sandholz, 2017). In this regard, recent studies approached historical conservation as a location factor for investments. not only tourism-related foreign direct investments (FDI), also all-sectors FDI have shown to be more attracted to heritage cities than non-heritage cities in Europe (Wall and Stavropoulos, 2014).

As described, heritage has been increasingly acknowledged as an engine to steer economic development (Yáñez, 2015), and more conditions have been provided to support this approach in the field of public management, according to Roders and Van Oers (2011). The 2030 Agenda, for instance, highlighted the importance of heritage for sustainable development by including culture within the context of Sustainable Development Goal 11. It encourages the integration of heritage conservation into urban development strategies and reinforces the need of aligning policies that have historically been approached separately (UNESCO, 2016). Adequate governance is crucial for effectively positioning heritage as an asset that is able to foster economic development (Geurts and Corten, 2014).

Brazil is one of the developing countries, where heritage conservation has been given little attention and not been sufficiently researched (Rypkema, 2014), considering basic economic conditions (United Nations, 2018). The absence of prioritization is reflected in scarcity of investments, insufficient funds to restore, rehabilitate and integrate protected structures into social and collective uses. Ultimately, it hinders heritage to fulfil its role in building the national identity and self-esteem (Bonduki, 2010).

1.2 Problem Statement

Although a growing trend in recognizing heritage values and potentialities has been observed, cultural heritage is still underprivileged in urban development policies, particularly in

developing countries. The pressure exerted by urbanization processes, such as highly densified-building policies, renewal plans and contemporary constructions threaten the integrity of heritage sites, especially ensembles within the urban fabric, that are more vulnerable to such forces (Roders and Van Oers, 2011, UNESCO, 2016, Rojas, 2016). Historical sites are often sacrificed under the justification of modernizing cities to steer economic development (Rama, 2012), to respond to the "global consumer culture" (Zukin, 2012, p. 282) and to accommodate the rapidly expanding population (Rojas, 2016). Specially in the second half of the 20th century, the rapid growth of real estate activities was determinant to this phenomenon (Rojas, 2016). Indeed, the research undertaken by Sandholz (2017) in developing countries confirms accelerated urbanization driven by economic growth as the main cause of losing history and culture within the built environment.

Conservation, regeneration and rehabilitation are important strategies for positioning heritage as an asset to contribute to urban development, however they are only recently among plans towards cities development (UNESCO, 2016). The insufficient understanding of the possible contribution of heritage to economic performance leads to abandonment or demolition of such areas, implicating the loss of potential assets for society.

The prevalent urbanization model in Brazil is significantly influenced by private industries (Sandholz, 2017). Car-oriented development strategies encourage the sprawl of cities, preventing historical central areas to be prioritized for investments. The focus lies on new land and, frequently, on developing old areas through demolition, so the building and real estate industries are able to grow (Furtado, Alcântara, et al., 2014, Sandholz, 2017). Additionally, and also particularly in Brazil, high levels of social inequality are reflected on the urban landscape, evidenced by the increasing phenomena of gated communities for the rich on suburbs and the relegation of central, often historically meaningful areas, to abandonment, creating a high perception of insecurity, which reinforces the so-called emptying process (Sandholz, 2017).

1.3 Research Objectives

As the main argument for disregarding heritage conservation in urban development processes is the necessity of enabling economic progress, this research aims at evaluating what are indeed the economic outcomes of having a conserved heritage ensemble for Brazilian cities. The majority of studies regarding this topic have assessed localized effects for the actors, the activities and the properties that are directly involved within protected areas or on the immediate surroundings, however rarely for the entire city.

The first objective of this thesis is, therefore, to assess the extent to which externalities produced by heritage conservation are perceived in different dimensions at the city-wide level. Since outcomes of conservation are often related to increase in tourism, services and entrepreneurial activities, investments, jobs creation and increase in property values (Rypkema, et al., 2011), one dimension refers to economic indicators such as GDP, income, employment and public revenue. The second dimension regards specifically the attractiveness of foreign and national investments of heritage cities. Furthermore, the economy tends to structurally change with conservation and incorporation of heritage ensembles into development strategies (Boland, 2013, Labadi, 2016). In this regard, the third dimension seeks to assess the differences of economic sectors between heritage and non-heritage cities.

Assessing overall indicators from heritage conservation potentially provides fruitful results, however is limited in capturing the necessary contextual conditions (Rypkema, et al., 2011). For this reason, the second objective of this research is to assess governance aspects, which are critical for ensuring a sustainable development (Roders and Van Oers, 2011). This aims at

understanding governance factors that steer the economic outcomes from heritage conservation.

The results shall clarify whether conserved heritage is sufficiently able to respond to contemporary urban demands in terms of economic development and in which manner it has been managed. The ultimate goal of this research is to provide compelling evidence on the merits of cultural heritage conservation for economic development and advance in the knowledge on managerial aspects towards maximizing such merits and mitigating or reversing the demerits. Literature suggests that the abovementioned indicators have real potential of being positively impacted by heritage conservation (O'Brien, 2012). If confirmed, demolition or dilapidation of historical, unique features is unjustifiable. If not, an in-depth understanding is needed on how local conditions should be adapted to enable heritage areas to perform in favour of economic profits, as it happens in developed countries. Furthermore, the understanding of gains from heritage potentially leads to a change of attitude towards preservation rather than demolition by stakeholders that play a critical role in conservation, such as public authorities, policy-makers and property owners (Sandholz, 2017).

It is important to highlight that assessing the economic effects of heritage preservation is intended at encouraging conservation of authentic, unique characters within the built environment. The aim is not encouraging the spectacularization of culture, also referred as "Disneyfication" of society by Harvey (2002). This phenomenon is described as a practice that envisions economic benefits from turning historical features and cultural actions into products for consumption. Within the urban environment, this process is mostly observed in the creation of architectural monuments to represent a city's character in an intended, thus artificial manner and of questionable authenticity. Besides, requalification of specific areas and the localized accentuation of culture steered at attractiveness purposes often produces spatial segregation and ultimately reinforce gentrification processes (Leite, 2013).

1.4 Research Questions

In this thesis, economic aspects are assessed by comparing two groups of cities: heritage and non-heritage ones. Cities of the former group are selected for having a conserved, historically relevant urban area, and this is ensured by adopting the official classification criteria of IPHAN[1]. This adds the official designation factor to these cities, which potentially changes their image and may steer the assessed outcomes. For this reason, designation is included in the concept of heritage areas conservation.

Main research question: How is the designated conservation of heritage areas and its governance factors related to economic performance of Brazilian cities?

Research question 1 (RQ1): How is the designated conservation of heritage areas related to economic performance of Brazilian cities?

- *Sub question 1.1 (SQ1.1):* How is the designated conservation of heritage areas related to overall economic indicators?
- *Sub question 1.2 (SQ1.2):* How is the designated conservation of heritage areas related to investments attractiveness?
- *Sub question 1.3 (SQ1.3):* What are the differences in types of industries between designated heritage and non-heritage cities?

[1] IPHAN is the National Institute for Historical and Artistic Heritage in Brazil

Research question 2 (RQ2): How are heritage governance factors related to economic performance of Brazilian cities?

1.5 Significance of the Study

Currently, different approaches to assess the effects of urban heritage conservation are adopted (UNESCO, 2016). Economic outcomes generated by heritage conservation have been demonstrated by several scholars through case studies. The research strategies of this thesis, however, are not commonly adopted to assess such effects. As the subject of heritage preservation economics have only recently emerged, the variation of methodologies enhances the development of the field. This is complemented by assessing dynamics in different levels, as trends across regional and national spheres adds to the investigation of localized processes (Rypkema, et al., 2011). This research also aims at contributing to this respect.

Heritage is largely endangered by the insufficient understanding of the potential outcomes from its conservation. "For too long too many cities have taken the position: 'Either we have heritage conservation, or we have economic development'" (Rypkema, 2014, p. 59). A complementary evidence of insufficient understanding of the potential benefits arisen from heritage conservation is the lack of priority on systematically researching such effects. Labadi (2016) highlights the insufficiency of data collection for this purpose, especially in a manner that enables comprehensive knowledge about economic and social effects.

Only recently urban management functions have been applied to heritage in developing countries. Therefore, the gap between theory and practice of cultural heritage conservation is still wide (Roders and Van Oers, 2011). Rypkema (2014) also stresses that, despite leading to consistent economic benefits within the developed world, heritage conservation in developing countries' context still needs its economic outcomes to be sufficiently assessed and highlights the urgency of understanding such outcomes. UNESCO's report (2016) reinforces the necessity of investigating the management of urban heritage and establishing conditions to promote it as an asset for development.

In Brazil, where the argument for neglection often overrides the reasons for protecting the urban, cultural heritage, the findings of this thesis may build upon the argument for conservation and prioritizing management strategies aimed at positioning historical features as engines for development.

1.6 Scope and Limitations

The scope of analysis of this thesis is cities in Brazil that are designated by IPHAN as heritage cities, as they have a conserved heritage ensemble within their urban fabric. A limitation regards the units of analysis: cities that might have a historical core, however are not officially designated by IPHAN as heritage, are not considered in this research. This may be the case of cities designated by state governments or municipalities as heritage, or cities that are simply not officially designated. As regulations in this regard vary enormously among different regions, the scope of this research is limited to cities that are officially designated at the national level.

The research is conducted at the city level, and it assesses relationships between heritage conservation and economic performance. However, it is not intentioned at conducting a detailed research of all factors that may explain such outcomes. The depth and breadth of analyses in this research are limited by the time availability. The aim is to capture impacts on economic performance that are attributable to heritage and briefly analyse channels that may explain such impact. A deeper research is necessary to draw firm conclusions on the relations that are not yet clearly elucidated. Gathering information about governance in heritage cities is

specially limited by time. An extensive research is necessary for obtaining a more comprehensive knowledge, by contacting the most appropriate people, encouraging them to share information, and obtaining detailed explanations through interviews, for instance. In this regard, this thesis is aimed at conducting an initial evaluation on how heritage is being managed, capturing a limited extent of qualitative data. In that sense, several possible analyses continuing from the findings of this research are indicated for future research.

Chapter 2: Literature Review

2.1 Cultural urban heritage

Civilizations have transformed and evolved over time, and increasingly interact among each other. Communities' cultures materialize within distinct times and locations, according to their decisions to assume unique values that differentiate themselves from the others, enhance social cohesion and remain over the generations (Arizpe, 2004).

Heritage is defined as an inheritance that is worthy of preservation to be transmitted from one generation to the future ones due to its natural or cultural value (Harrison, 2010, Nijkamp, 2012). Within the cultural heritage, expressions as music, literature, language and rituals are regarded as the movable, intangible dimension of heritage and are of similar value as the tangible dimension. The latter refers to physical elements such as archives, archaeological findings, museum collections, buildings and properties that perpetuate culture and contributes to building the collective memory (UNESCO, 2016). Judging what is historically and culturally significant and thus worthy of preservation varies through time and place and is a major source of unclarities in defining what heritage is.

The global level of heritage classification in defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO). The Outstanding Universal Value (OUV) of a place is what determines its designation as World Heritage, and it refers to a value of such exceptionality that transcends countries' limits, being of a high significance for the human community and motivating the conservation for the present and future generations (Roders and Van Oers, 2011, UNESCO, 2015). The organization conducts the classification of both Cultural and Natural Heritage, following similar guidelines for both. Among the ten criteria established to assess the OUV of a property under analysis, six refer to cultural heritage (Table 1), and are related to the representativeness of human creativity, history, culture and values within the built environment.

	Cultural criteria for World Heritage listing
(i)	To represent a masterpiece of human creative genius;
(ii)	To exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
(iii)	To bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
(iv)	To be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
(v)	To be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
(vi)	To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance.

Table 1 – List of criteria for listing cultural World Heritage (UNESCO, 2015)

The judgement of such values is conducted by the World Heritage Committee, composed of representatives of states that have ratified the World Heritage Convention. The Convention was adopted in 1972 and refers to a cooperative agreement of nations to acknowledge and protect properties of outstanding, universal and unique value, establishing a framework to support local actions for heritage safeguard. The Committee evaluates proposals of nominations submitted by State parties, considering the criteria listed above. Besides, the property must present appropriate conditions with regards to authenticity and integrity.

The nomination is a reference for future conservation and management, however does not impose official regulations to a site, as this is assigned to national and sub-national levels of government. Nominating a site for the title of World Heritage involves commitment from the State Party in allocating efforts and resources for properly protecting the property and its value, placing administrative, scientific, legal, technical and financial means for this purpose, and constantly monitoring and reporting the state of its conservation (UNESCO, 2015). Allowing the loss of authenticity or failing in managing conservation of an inscribed property implies the de-listing of it as World Heritage.

The perspective of the values of cultural heritage has expanded over the past decades, contributing to the development of concepts and approaches. For a long time, heritage protection was restricted to preventing the demolition of individual buildings and monuments (Roders and Van Oers, 2011), which later evolved to archaeological sites and to urban areas within the built environment (Rypkema, et al., 2011). The scale of social representativeness has also expanded. Formally, the decision of what should be preserved, and the conservation practices were mainly steered and restricted within the culture of elite groups (Rojas, 2016). Currently, such processes are increasingly embracing different groups' identities and various cultural manifestations, implicating a complex, holistic arrangement of private and public urban actors (Rojas, 2016), regulations for properties' uses and surroundings, and requirements from economic, cultural, environmental and social spheres of society (Roders and Van Oers, 2011). This process is largely associated with the increased awareness of the values of heritage to the society and to people's culture (Rojas, 2016).

Indeed, UNESCO (2015) currently classifies cultural tangible heritage in three categories: monuments, sites and groups of buildings. The latter is defined as ensembles of buildings that

are of OUV due to architectural characteristics, homogeneity among themselves or their relationship with the landscape, from scientific, artistic or historical perspectives. Nonetheless, despite the increasing approach of heritage protection to the urban scale, the definition of cultural urban heritage and the concept of World Heritage city have not been sufficiently developed in the Convention or by management bodies (UNESCO, 2016). Cities listed as World Heritage present an array of characteristics, from sizes and shares of historical areas in a given city, to the spread of heritage properties within urban settlements and the typologies of urban arrangements on landscapes.

In that sense, the concept of Historic Urban Landscape (HUL) was recently created as an attempt of capturing the broad complexity that is intrinsic to urban settlements and translate it into conservation guidelines. It includes geographical characteristics, either ancient and modern constructions and infrastructures, public and green areas, the urban fabric, land organization and other physical aspects of the site. Besides, it aims at incorporating the economic, social and cultural dynamics and the intangible aspects of culture with respect to identity and diversity of the local population into the conservation of the built environment. Objectives of this approach include leveraging productivity of urban activities and preserving the human environment, when considering cultural creativity as asset for development. By approaching heritage cities as living, social and economic assets and adopting strategies for managing them as such, the natural, the built and the human environment may develop a relationship with high potential to sustain over time (Roders and Van Oers, 2011).

Besides the World Heritage guidelines and frequently referring to them, national governments establish specific regulations for own cultural heritage protection. Such regulation also defines the decentralization levels of this responsibility, assigning functions for sub-national entities (Roders and Van Oers, 2011).

2.1.1 Heritage designation in Brazil

The first legal recognition of heritage protection at the national level is the 1934 Constitution. Subsequent regulations to protect the Brazilian cultural heritage date from 1937, aimed at officially organizing the protection of national historical and artistic heritage. The decree-law number 25 created an official public body exclusively responsible for services and activities related to Heritage: The National Service for Historical and Artistic Heritage, which became the National Institute for Historical and Artistic Heritage (IPHAN) in 1970. National historical and artistic heritage was then defined as constituent of tangible and intangible assets which conservation is of public interest. The main arguments were limited to their outstanding universal value related to bibliographical, artistic, archaeological or ethnographical factors, or their link to remarkable events of history. The designation of assets as heritage becomes official once they are registered in one of the four "Books of Tombo"[2]. The first Book refers to archaeological, ethnographic and landscape values, the second to historical value, the third to fine arts and the fourth to applied arts. Protected urban settlements are often listed in the second book, less frequently in the first or the third, or also in more than one. The 1930's national context presented a political demand to define a national identity, aimed at determining the Brazilian character of living and at enabling people's recognition of their own history and cultural values (Sant'Anna, 2017). According to Sant'Anna (2017), there was heritage protection at city scale in the Western world during that time besides isolated cases, e.g., the city of Ouro Preto. Still, the designation did not imply practical consequences beyond the title of national heritage. The year of 1938 witnessed the protection of six other cities in the state of

[2] "Tombo" and "tombamento" are originally from the Portuguese legal system and entail the practice of inventorying or inscribing an asset at an official archive (Borges, 2005).

Minas Gerais, an innovation in the field of official heritage conservation (Sant'Anna, 2017), that was soon discontinued.

During the subsequent years, the modernist ideology became dominant, steering a process of renovation of public institutions that, consequently, influenced how artistic, cultural and social activities were managed (Sandholz, 2017). Modernization was broadly accepted as the fate of cities, hindering the interest of local communities to protect historical areas in favour of development, to the extent that, during the 1950's decade, only marginalized urban settlements were officially protected. Heritage protection suffered resistance by municipal entities, worsened by the fact that the decision for conservation was made by the national government, regardless of the local actors' willingness (Sant'Anna, 2017).

European practices then started to change the Brazilian perspective for approaching heritage. Procedures for selecting cities for conservation and management practices changed between the 1960's and the 1980's, as the understanding of the historical city as a static artistic monument was still prevalent, however, decision makers started to consider a broader range of urban dynamics (Sant'Anna, 2017), influenced by the Venice Charter (ICOMOS, 1964). The latter also guided the consolidation of Brazilian legislation regarding the protection of urban heritage ensembles.

Although specific norms were yet undefined, guidelines for planning and intervention practices were formulated as attempts to include heritage into holistic urban development strategies. Additionally, the decentralization of management emerged, and significant actions for heritage governance started to be implemented at the municipal levels during the 1970's. Initially, however, only large cities were able to conduct it in an integrated manner (Sandholz, 2017, Sant'Anna, 2017).

Accompanying the trend described above, the Brazilian Constitution of 1988 conceptualizes cultural heritage in a broader scale. The recognition of heritage features expanded to collective attributes, such as groups' intangible memories and urban settlements in addition to individual monuments (Schlee, 2017). Currently, the legal definition of Brazilian cultural heritage is "the assets of a material and immaterial nature, taken individually or as a whole, which bear reference to the identity, action and memory of the various groups that form the Brazilian society" (Federal Constitution, 1988, article 216). It includes the assets listed in Table 2.

	Assets that form the Brazilian cultural heritage
I	Forms of expression;
II	Ways of creating, making and living;
III	Scientific, artistic and technological creations;
IV	Works, objects, documents, buildings and other spaces;
V	Urban complexes and sites of historical, natural, artistic, archaeological, paleontological, ecological and scientific value

Table 2 - Cultural heritage assets of Brazil (Federal Constitution, 1988, article 216)

A significant change in the 1988 Constitution regards the appreciation of cultural diversity and inclusion of social plurality, opposed to the designation process of the 1930's, when a property or a city was declared heritage after a governmental top-down decision, and prioritized colonial elite properties and churches; rarely considering the preferences of the population (Sandholz, 2017). Previously, the inscriptions in the "Books of Tombo" disregarded cultural aspects of the original population and excessively valued the culture brought by European colonizers, closely related to elite groups in Brazil (Fonseca, 2003).

2.1.2 Heritage protection and consequences

Worldwide, heritage enlistment is the principal regulation to officialise its protection and consists on a list of buildings or public spaces of relevant cultural and historical values within a specific jurisdiction. It is an official declaration of the relevance of a given property to the society, and the necessity of protecting it to future generations. Such properties are subject of requirements, documentation, obligations, rules and policies for management, established by each jurisdiction (Throsby, 2012). Levels of flexibility, adaptability or rigidity vary enormously according to local regulations. The official recognition largely shifts the public perception of a property to one that is detached from the daily urban life for embodying a special value, and generally leads to the assumption that such places will be appreciated by visitors and citizens (Harrison, 2010).

The extent to which an urban heritage area is regulated to remain intact poses the major challenge of heritage management. From one perspective, a balanced flexibility allows for a city's development, as well as for historical buildings to adapt to urban dynamics as a means of survival within urban pressures. On the other hand, new developments tend to be considered incompatible and might damage the overall aspect of a heritage site, once protected for its harmonic, unique characteristics of landscape or surrounding areas (Roders and Van Oers, 2011).

Currently, at the national level, any citizen is allowed to initiate a requirement for heritage designation. IPHAN conducts an extensive analysis of authenticity, cultural significance and conservation integrity of the sites, in order to evaluate the pertinence of officialising their protection. The procedure's bureaucracy entails a long period of uncertainty on the conservation, potentially hindering a place's integrity. For this reason, the Constitution (1988) also provides restriction to the use and ownership of a given asset before the legal procedure is completed, acknowledging its complexity and reducing threats to the heritage's integrity (Borges, 2005). In that sense, the recognition of the cultural value that is embedded in the object to be protected is understood as a public, collective interest for conservation, which is immediately enabled with a provisional status. During the analysis period, arguments against an asset's protection are also assessed. Ultimately, the technical analysis is submitted to the Consulting Board, for deliberating on either protecting the asset or cancelling the process. This Board is composed of representatives from public and private institutions, as well as the society.

Fonseca (2003) recognizes that Brazilian policies that institute the designation of heritage contributed to preserving buildings of historical value, which loss would be irreversible. However, the preservation practice has largely entailed ideas of rigid conservation and immutability, opposed to the need of flexible capacity and focusing on the physical structure rather than on its significance over time. This is worsened by the prevalent understanding that, in order to accomplish its social functions, the historical unit should remain intact (Sant'Anna, 2017). In that sense, article 216 of the Federal Constitution (1988) defines further flexibilization of the official protection. It defines alternative protection instruments, such as cadastre, expropriation, vigilance and inventory.

Nevertheless, the acknowledgement of the urban environment as a living organism is still currently not explicit in the regulations for urban ensembles protection, hindering historical areas to resist the threats exerted by urban growth and transformation (Sant'Anna, 2017). Important concepts should be considered and managed in this regard, such as the acknowledgement and publication of what are the attributes to be protected for a communal understanding. Since the character of a city is defined by buildings, physical and natural

elements, a broad composition should be designated for protection, as exemplified by the Urban Heritage Landscape approach by UNESCO.

2.1.3 Threats for urban heritage

Cultural aspects have been disregarded within urban development plans and actions, notably evidenced by the standardization of urban renewal projects, and the approach to heritage conservation in isolation from general urban development strategies (UNESCO, 2016). Even in cities acknowledged by their historical features, planning processes mainly ignore the intangible values embodied in places, failing to protect heritage. Additionally, Brazilian planning policies frequently adopt international criterion for cities, not necessarily effective to such unique contexts of cultural, local traditions, hindering the sustainability of conservation over time (Sandholz, 2017).

Furthermore, historical sites are often destroyed under the justification of modernizing cities to steer economic development (Rama, 2012), respond to the "global consumer culture" (Zukin, 2012, p. 282) and accommodate the rapidly expanding population (Rojas, 2016). Especially in the second half of the 20th century, the rapid growth of real estate activities was determinant to this phenomenon (Rojas, 2016). Indeed, Sandholz (2017) stresses that, in developing countries, accelerated urbanization driven by economic growth is the main process contributing to vanishing history and culture within the built environment. The harmful search for profits disregards long-term damages and prevents transmitting heritage values forward to future generations (Labadi and Logan, 2016).

New developments within urban areas generally starts by seeking available space, which is frequently provided by demolishing existing structures. The empty land then provides the opportunity of developing the so-called "soulless agglomerations of generic architecture" (Rama, 2012, p. 16). This process also occurs indirectly, by focusing on developments in the available areas in cities' peripheries and neglecting historical, central areas, which, in consequence, suffer the process of decay. The abandoned state of such structures often prevents deciding for revitalization due to high costs, reinforcing arguments for demolition (Rama, 2012, Sandholz, 2017).

Rama (2012) states that the transformative process of demolishing parts of cities to create availability for new development is aggravated by its irreversible nature, since it is naturally impossible to establish the community as in the past and achieve the same built outcome. Besides, recovering costs more than simply preserving it (Rama, 2012).

2.2 Economic outcomes of heritage conservation

> *"Over the long term, places with strong, distinctive identities are more likely to prosper than places without them. Every place must identify its strongest, most distinctive features and develop them or run the risk of being all things to all persons and nothing special to any. […] Liveability is not a middle-class luxury. It is an economic imperative."* – Nobel Prize Laureate Robert Merton Solow

Contrary to the arguments for demolishing historically relevant ensembles within the built environment, the prosperity argument abovementioned by Solow has a great potential to encourage decision-makers to protect such areas, however have not yet been sufficiently recognized and understood within developing countries (Rypkema, 2014).

Fortunately, the assessment of values and benefits leveraged by heritage conservation, such as liveability and economic outcomes have been increasingly discussed and studied through several approaches. It is important to notice that assessments in that sense must be always

accompanied by the acknowledgement that the uniqueness of historical features has cultural values that are beyond the ability of statistics to capture; uniqueness is not replicable (Bakhshi and Throsby, 2010). The potential economic benefits are recommended not to be the primary reason for deciding on heritage conservation (UNESCO, 2011), however it is a fact that those who hold a stake at heritage governance are "legitimately concerned with economic ramifications" (Rypkema 2014 p. 49), and revealing these ramifications may clarify its significance for urban actors and steer management efforts towards optimizing outcomes.

Various outcomes from heritage conservation activities are assessed in the existing literature, and the majority relates to the development of tourism. Mainly developing countries are increasingly adopting culture as a supporter of urban economies. This is clearly perceived through a meaningful growth in creative industries (UNESCO, 2016). Throsby and Bakhshi (2010) also state that the principal financial yield from heritage conservation stems from tourism and cultural industries, and that these underpin economic growth through opportunities for entrepreneurship, expansion of economic activities, employment and, ultimately, positive externalities to the wider community. Rypkema et al (2011) reinforce the predominance of such impacts, when recommend measuring the economic yields of tourism activities as a major contribution from heritage conservation.

The authenticity and cultural vibrancy of heritage cities also foster the development of the creative class. The latter is defined by Florida (2002) as highly educated population whose professions relate to tackling complex issues, either by traditional knowledge such as administrative business, law, healthcare and education or by creating solutions, which is the case of designers, artists, musicians and even engineers and researchers. It is argued that this class of workers is relatively mobile and attracted by cities that offer more than basic functions. Heritage, thus, works as a factor for enhancing such phenomena. The implication is a larger share of highly qualified inhabitants, which in turn influence how the economy develops (Geurts and Corten, 2014).

A branch of economics assesses "stated preferences" and "revealed preferences" of the city-wide population, which consists of a subjective evaluation of the pertinence and the willingness to pay for conserving heritage properties, or for visiting them, when tourism activities are accounted for. It has also identified positive revenues for local residents from tourism (Pearce and Ozdemmiroglu, 2002, Rama, 2012). Classic investment evaluations, such as cost-benefit analysis, multicriteria analysis and others consider financial payoff and cultural benefits. Among the benefits, city-wide results also refer mainly to revenue from tourism with reasonable net values and rates of return, jobs creation, external investments, local enterprises, and, ultimately, poverty reduction (Throsby, 2012, Nijkamp, 2012).

Aligned with that, a study on regeneration interventions conducted by Rypkema (2012) indicates local governments as frequent major beneficiaries, reflected by an increase on tax revenues, stemming from increased property values, reinvestments, less vacant areas, middle-class in-migration to heritage cores and stabilization of businesses, among others. Also contributing to public revenue, increased property values is reported as an economic gain from heritage conservation. It is an indirect effect from an array of actions developed during regeneration investments, for instance, on infrastructure, unfolding reactions as individual private investments on protected properties, as well as improving the sense of place. Property values are frequently calculated using the hedonic price model, that accounts for the location of the property and for effects from specific strategies (Rama, 2012, Rypkema, et al., 2011). This approach is facilitated by the high frequency of real estate assessments, often on a yearly basis. It also considers the negative effects that restrictive regulations for preservation, such as zoning, might cause (Rypkema, et al., 2011). Nevertheless, studies attribute to heritage

designation an increase of approximately 15% in houses prices within historical cores and 13% in properties located on the boundaries (Been, Ellen, et al., 2016).

Investments represent an important factor of economic development, largely related to the increase in the supply of jobs and firms' development (O'Brien, 2012). The cultural atmosphere and the authenticity underpinned by heritage in urban forms and assets are stated to help cities in differentiating from competitors and thus enhancing attractiveness for both domestic and foreign investments. Indeed, an assessment throughout European cities measured the count of inwards FDI between 2003 and 2012 and has confirmed the hypothesis that the historical character is significant for economic globalization, by concluding that heritage cities "receive on average 41 investments more than non-heritage cities" (Wall and Stavropoulos, 2014, p. 59). Furthermore, developing countries have responded for more than 50% of total FDI flows of the world since 2010. Such flows have triggered a structural change in these economies, as the importance of knowledge-based investments have grown in comparison to manufacturing ones. Such phenomenon relates to the fact that firms in the creative industry are increasingly being attracted by the liveability of cities rather than just wide advantages of a given country, as occurred previously (O'Brien, 2012).

Job creation has also been adopted as a measurement of economic effects from heritage conservation. Among others, such outcome results from civil construction accelerated by the renovation of buildings or other preservation actions. It is argued, however, that the duration of these jobs is mostly short and that employees are often people from different cities, therefore do not directly benefit the place where the intervention happens (Rypkema, et al., 2011, Labadi, 2016). Nevertheless, this is a labour-intensive industry that employs a wide range of workers. Moreover, it has been proven that, in the longer-term, local employment is positively affected by the outcomes of regeneration projects, as people are attracted to live in historical areas, fostering economic dynamics such as enterprises, street activities, and other businesses (Rypkema, 2012).

Although research has been increasingly conducted in that sense and demonstrated that economic benefits outweigh the expenses of heritage conservation, the understanding of this relationship remains incomplete and not exhaustively documented (Rypkema, et al., 2011). Medium and long-term impacts of heritage investments on economic and cultural aspects are even more rarely assessed (Throsby, 2012).

2.3 Governance factors

The arguments in the previous section showed that heritage features have the potential to contribute to economic growth. However, deciding for conserving heritage should be understood as the initial stage of development. In the recent years, the concept of heritage acquired a broader understanding, with the acknowledgement of the complexity and the range of opportunities stemming from it (Rypkema, et al., 2011). Effective management strategies, however, play a crucial role in embodying historical areas into development plans and thus in sustaining conservation throughout time, as well as catalysing wider development processes (Roders and Van Oers, 2011, Labadi, 2016).

The range of actors involved has also expanded. Traditionally led by governments, heritage is currently becoming a matter of innovative and varied partnerships involving a wider range of urban actors (UNESCO, 2016, Rojas, 2016). Multiple scholars raise the argument that heritage preservation is legitimized through its multiple values, identified by different urban stakeholders. The breadth of debates and public participation into the development of heritage management strategies is significant for preventing deterioration of historical properties and ensuring the continuity of development plans (Fonseca, 2003, Arizpe, 2004, Roders and Van

Oers, 2011, Murzyn-Kupisz and Działek, 2013, Leite, 2013, Labadi, 2016). O'Brien (2012) stresses the urgency of prioritizing heritage at an early stage of development plans, as pressure from urbanization and from competition among cities increases and might cause the irreversible destruction of such asset.

UNESCO's Operational Guidelines (2015) recognize such necessities as it details the requirements of the World Heritage Convention, requiring from listing proposals the establishment and description of a system of management practices aimed at preserving the Outstanding Universal Value of a given property, translated into a transparent, accountable and "commonly agreed management plan" (Roders and Van Oers, 2011, p. 281). This should include, as a minimum set of actions, the broad understanding of the site by stakeholders and potential collaborators and their involvement in developing the plan, the assignment of means to achieve the proposed actions, capacity building, and a series of processes from planning to monitoring results to enable the continuity of plans. The aim is to steer daily decisions regarding heritage areas conservation towards an outcome that is desired by the involved community.

Image transformation and differentiation as an investment attractiveness factor has been increasingly adopted as the aim of heritage-led development strategies, and, combined with other factors, have proven to be successful. This phenomenon is frequently triggered by urban regeneration (O'Brien, 2012) and highlighted by heritage designation through titles provided by official organizations. Furthermore, such titles also implies the change from an industrial, manufacturing economic image to creative, cultural and service-driven (Boland, 2013, Labadi, 2016). In that sense, publicizing a city's unique identity, largely materialized on its cultural heritage, is the strategy of place marketing (Ashworth and Kavaratzis, 2009, Boland, 2013, Labadi, 2016, UNESCO, 2016). Such strategy affirms the positive aspects of a heritage city and contributes to building the image of an innovative, creative territory, with a confident and proud population. Besides, it creates a good reputation of economic and social success that is not necessarily real, but one that businesses consider in their decision on a location and that enterprises demand with respect to reliability to succeed. It is important to consider, however, that disproportionate greater investments might lead to the loss of the unique character and values from cultural heritage conservation, that once motivated their place decision (Ashworth and Kavaratzis, 2009, Labadi, 2016).

Linked to the attraction of firms and workers, it is critical to maintain the residential use within historical cores, for a range of socio-economic groups. This is key to ensure vibrancy and the offer of services and goods, besides contributing to community life, engagement in protection and, consequently, conservation in the long term (Roders and Van Oers, 2011, O'Brien, 2012).

2.3.1 Heritage governance in Brazil

With the change in mindset of the 1970's decade, novel functions of heritage cities were recognized, such as of potential drivers of urban economic development, mainly through cultural and touristic activities, distancing from the understanding of urban heritage as a static historical feature. Guidelines for planning and intervention practices started to formulate strategies and further governance aspects (Sant'Anna, 2017, Sandholz, 2017).

In Brazil, urban regeneration is a major strategy for conservation of heritage and upgrading of core areas. Usually, the decision of regenerating stems from the understanding that cultural values are being lost with the demolition or decay of historical buildings (Sandholz, 2017). Acting as an enabling factor for regeneration that also yields positive outcomes, the construction sector receives investments on capacity building for conservation and restoration services (Sant'Anna, 2017). Also, largely combined with regeneration processes, the adaptive

rehabilitation consists on adapting historical buildings for contemporary uses by undertaking small changes (Throsby, 2012). It has proven to be effective in allowing continued use, sustaining its conservation over time (Rojas, 2016).

The link between cultural preservation and tourism as the potential activity to ensure economic sustainability is also prevalent in Brazil (Sant'Anna, 2017, Sandholz, 2017). It is important to stress, however, that such strategy is not able to ensure development per se. Mainly targeting economic aims, Sant'Anna (2017) reports that significant investments in the 1960's have solely prioritized touristic infrastructure, understanding it would further unfold tourism and other activities that would sustain heritage conservation over time. This was later proven to be ineffective, as cultural tourism alone is not able to leverage economic growth and preserve built areas, reinforcing the need for holistic approaches.

Like the majority of urban actions, financial resources are critical in decision-making processes regarding the implementation of plans. Broadly adopted in Brazilian cities, creating a specific fund has been seen as a solution to secure investments on specific targets, including cultural development and heritage conservation. Additionally, public funds from municipal budget or covenants with higher spheres of government to raise funds is frequently adopted as a solution to enable interventions. Such initiative has the potential to build trust on publicly-led processes, that occasionally encourage local residents to invest on conservation and upgrading of own properties (Rama, 2012). Also, in this regard, fiscal incentives have been provided for owners of designated properties as an encouragement for conservation actions as a compensation for the impossibility of further developing it (Throsby, 2012).

Great challenges have accompanied the governance of heritage in Brazilian cities. Until the 1960's decade, local actors were rarely involved in the decision-making processes of protecting their own cities, contributing to conflicting situations, unclear roles and unwillingness of inhabitants to preserve properties. Initiatives for the decentralization of management emerged in the 1970's. Simultaneously, IPHAN took over local responsibilities such as licensing and supervising interventions in historical areas to ensure the integrity of protected areas, a practice that still occurs in a number of national heritage cities (Sant'Anna, 2017).

The Heritage Cities Program of 1973 symbolizes an effort towards systemic, multilevel management (Correa, 2016). A national system of heritage management was implemented with the legal creation of state institutions, locally responsible for implementing activities idealized and supported by IPHAN (Sant'Anna, 2017, Sandholz, 2017). As this program ceased, the integrated system was dismantled and implied the isolation of each government level's management of heritage, enhanced by the creation of regulations for municipalities during the late 1970's (Sant'Anna, 2017).

In terms of management, the 1988 Constitution defines that each federal state is responsible for maintaining an updated list and cadastre of heritage within its boundaries. However, the means and standards for that are not clearly defined, contributing to the isolation of practices adopted in each sphere of government. The success of conservation within the sustainable development goals is highly dependent on the extent of interactions between the different spheres of government and responsible institutions. The inconsistency over the different levels' regulations is harmful to management practices, as well as the range of disorganized norms, laws and decrees (Sandholz, 2017).

The municipal legal role of conservation is also clearly established for the first time in the Federal Constitution of 1988 (Schlee, 2017). However, sharing responsibilities have been a source of mismanagement due to unclear roles; being heritage situated on local land, Sant'Anna (2017) argues the responsibility of its management should be entirely assigned to municipal

governments. Furthermore, since the existing policies at different levels omit the establishment of cooperation between those levels, heritage management changes significantly over political mandates, undermining its capacity of steering sustainable development of cities (Sandholz, 2017). Indeed, governance has been stated as one of the current main challenges in heritage conservation. In that sense, political will and interest influence major decisions, frequently disregarding research results or either steering those to own interest (Rypkema, et al., 2011)

Although several international agreements provide guidelines and rules in that respect, management strategies and challenges are insufficiently assessed and put forward to help implementation at the local level (Rojas, 2016). This is still a relatively recent field of research, and the gap between theory and practice is prevalent. Hence, there is insufficient available information regarding the impacts of practices in this field to be disseminated (Roders and Van Oers, 2011).

2.4 Conceptualization and conceptual framework

The literature discussed in the previous sections suggests that conserving urban heritage areas affects the economic performance of Brazilian cities, mainly in a positive way, through a variety of activities and externalities. It has also described management strategies and challenges that are critical for such outcomes, as they may favor or hinder development

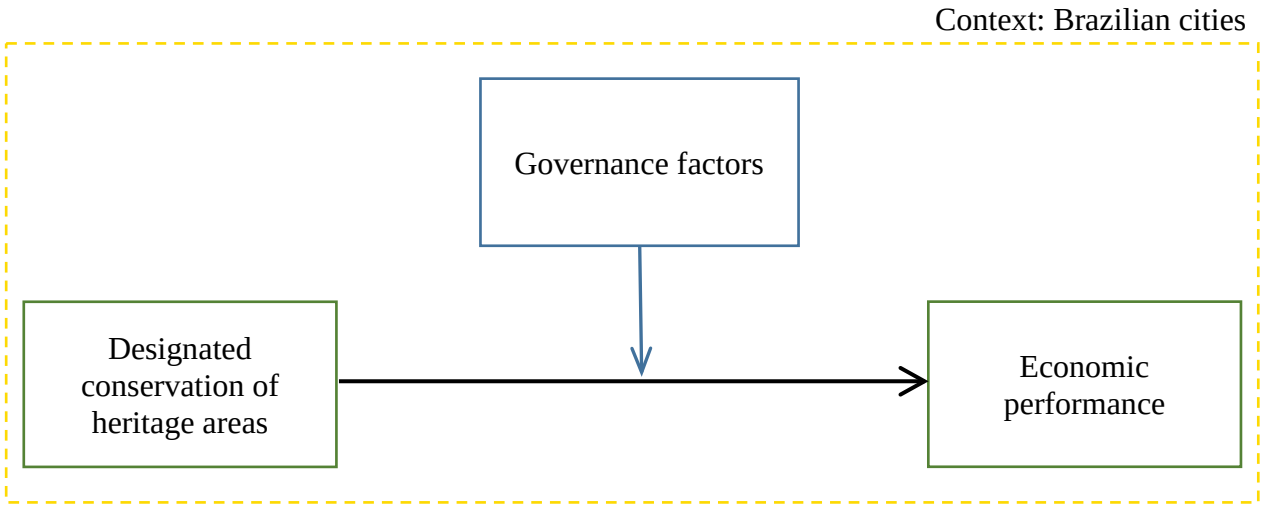
Designated conservation of heritage areas is the concept for delimited areas within the urban built environment with significant historical characteristics and are, therefore, worth of conservation. Consequently, their protection is officially designated by IPHAN. Throughout this thesis, the concept is also referred to as “heritage conservation”, “heritage designation”, “designated heritage conservation” and “heritage factor” to simplify the readability only, carrying the same meaning.

Governance factors summarize actions, methods, conditions, difficulties, and barriers that affect managing heritage areas and that potentially steer their contributions to the economy.

Economic performance stands for city-level indicators that represent how inhabitants and firms in cities are developing in terms of market, gains, profits, structure, investments, tax collection, among others specified in Table 3.

2.4.1 Conceptual Framework

The conceptual framework, therefore, displays the relationship that is assessed in this thesis: the one between heritage conservation and economic performance in Brazilian cities, which is intermediated by governance factors.



Chapter 3: Research Design and Methods

The strategy designed to answer the research questions comprises a combination of approaches. This chapter details the operationalization of concepts presented above, the relations to be assessed and the methods for collecting and analysing data. In the end, a discussion about validity and reliability is presented.

3.1 Research strategy

A universally agreed methodology to assess economic impacts from heritage conservation does not exist. Nevertheless, there is a recognized necessity to assess both key indicators and local factors (Rypkema, et al., 2011). The former refers to assessing metrics that are commonly adopted and broadly recognized. The latter aims at capturing conditions at the local level that might influence outcomes. For this reason, two main methods are adopted in this research.

The first method is a desk research using secondary data. This kind of research enables the collection of a meaningful quantity of data (Van Thiel, 2014). Sufficient sources for this purpose exist and are available. A quantitative, statistical analysis is then conducted, which allows for identifying effects on performance and structure of the economy that are related to heritage conservation and the magnitude of such effects. It thus provides information to answer *RQ1* and an indication about relevant aspects for future in-depth investigation.

The second method comprises a survey aimed at obtaining new, primary data on the local governance of protected ensembles, targeted at municipal officers. According to the literature review, an array of management strategies and challenges drive the success or failure of embodying heritage ensembles into urban dynamics and thus positioning these areas as assets for development. Results yielded from the two approaches are then jointly assessed. The economic indicators that show significant relations with heritage conservation are confronted with the survey results to answer *RQ2*, attempting at obtaining more comprehensive conclusions and answer the main research question.

3.1.1 Classification of cities

The whole of 5,570 cities of Brazil composes the initial sample. Heritage cities are identified as the ones that are formally designated as such by IPHAN, meaning that the existence of a conserved historical ensemble within the urban area is officially recognized. Thus, cities are simply classified as non-heritage and designated heritage, which are referred simply as heritage in this thesis, for a fluid readability. Cities that are currently under assessment by IPHAN and not yet officially designated are excluded from the analysis, due to the uncertainty of the existence of a preserved, historically relevant urban ensemble. Similarly, as the majority of available data refers to the year of 2010, this is adopted as the limit year for heritage designation, aiming at assessing its effects on the selected indicators. As such, cities designated after 2010 are also excluded from the sample.

Despite the fact that data is available for the whole of Brazilian cities, the majority of indicators lack a few observations, which is perceived according to each model of analysis presented in the next chapter of this thesis.

3.1.2 Controlling for external factors

Cities classified as non-heritage compose the control group, so the effects from heritage conservation (the main independent variable) are isolated. As such, the analysis is undertaken by comparing cities that are designated as national heritage with the ones that are not.

The control variables, presented in the operationalization table (Table 3), aim at accounting for factors that influence the dependent variables, however, are not part of the heritage

characteristics under assessment, defined in the following section. The selection of such variables considered the availability of city-level data.

3.2 Operationalization – variables and indicators

Concept	Variable	Indicator	Type	Unit
Main independent variable				
Designated conservation of heritage areas	National heritage cities designated until 2010	Non-heritage vs. designated heritage	B	0-1
Dependent variables				
Economic performance	GDP per capita	Gross domestic product over city population	C	R$
	Income per capita	Household income over house dwellers	C	R$
	Public revenue (rate)	Public municipal revenue over city population in 2013	C	R$
	Jobs (rate)	Occupied population over city population	C	
	FDI dummy	No FDI vs. minimal 1 FDI	B	0-1
	FDI count (rate)	Count of FDI between 2010-2016 over city population	C	
	FDI value (rate)	Value of FDI between 2010-2016 over city population	C	million Euros
	Domestic investment dummy	No domestic investment vs. minimal 1 domestic investment	B	0-1
	Domestic investment (rate)	Count of domestic investments over city population until 2013	C	
	Firms A - U*	Share of firms of sectors A - U over total of firms of the city	C	
	FDI B - U*	Count of FDI of sectors B - U in the city between 2010-2016	C	
Intermediating variables				
Governance factors	Relevance of strategies	Urban regeneration	O	1-7
		Integration to urban regulations		
		Land use regulations:		
		- Compulsory use		
		- Transfer of development rights		
		Rehabilitation/ adaptive reuse		
		Promotion of residential use		
		Social housing		
		City marketing		
		Public investments		
		Encouragement of private investments		
		Public participation		
		Broad awareness		
	Relevance of challenges	Insufficient political commitment	O	1-7
		Budgetary constraints		
		Interaction with national level of government		
		Conflicting interests between stakeholders		
		Pressure by real estate		

Control variables				
City size	Population	Number of inhabitants	C	
Region	Federation state	State of location	N	
Accessibility	Proximity index	Direct transportation connections between the city and all others points of the network	C	0-1
Natural attractiveness	Coastal city	Located on the coast or not	B	0-1
Human capital	Higher education (rate)	Number of people with university degree over total city population	C	
Investments	FDI count (rate)	Number of FDI over city population before 2010	C	
	Domestic investment (rate)	Number of domestic investments over city population	C	
Market size	GDP per capita	GDP over city population	C	
Population density	Density	City population over area	C	
Firms in a city	Firms (rate)	Number of firms over city population	C	
Labour-intensity of firms in a city	Jobs per firm	Occupied population over number of firms of the city	C	

B: Binary; **C**: Continuous; **O**: Ordinal; **N**: Nominal

*The list of classification of industrial sectors is found in Annex 1

When not specified, year of reference is 2010 and values are Brazilian reals (R$)

Table 3 - Operationalization table

City **population**, although not directly included in the model, is used to normalize gross indicators into rate values that enables the comparison across different-sized cities, as development based on heritage conservation also happens at varied paces depending on city size (Labadi, 2016). In that sense, all indicators are expressed in per capita values in this research. Control variables:

- **Region**: states are officially named federal units in Brazil, adopted as control variables since economic performance and structure vary enormously among regions (Daumal and Ozyurt, 2010).
- **Accessibility**: accessibility performs an important factor of location choice by companies (Pereira and Lemos, 2003, Wall and Stavropoulos, 2014), and proximity index is a proxy in this research. It is calculated using the number of connections a given city (origin) has with other cities through public transportation, divided by the changes needed to reach these cities from the origin. 01 would be the ideal scenario, meaning that the origin is directly connected to all other cities in the network (IBGE, 2017).
- **Natural attractiveness**: operationalized through the geographical position in relation to the coast (cities tagged with 1 sit on the coast and have beaches), as access to maritime routes and natural features might attract investments and visitors, which steer the development of these cities (MMA, 1997).
- **Human capital**: Through a variety of channels, human capital is fundamental in explaining economic growth and different results across regions, as several studies have confirmed that higher levels of education represent a competitive advantage and are associated with better economic performance (Wall and Stavropoulos, 2014). This is also confirmed in Brazil (Pereira and Lemos, 2003, de Lucas Bondezan and Dias, 2017). This study considers the rate between the number of people with university degree and the total population of the city as a control variable.

- **Investments**: the variable is employed as dependent variable however also acts as a controlling factor for economic performance, since such variables present a reinforcing relationship (Zhang, 2001, de Lucas Bondezan and Dias, 2017).
- **Market size**: expressed by GDP per capita in this research, which is also as a dependent variables, it is a factor that explains the behaviour of firms and investments attractiveness (Pereira and Lemos, 2003).
- **Population density**: high correlation between density and economic success is proven by scholars (Florida, 2002, Wall and Stavropoulos, 2014).
- **Firms (rate) and jobs per firm**: the proportional number of firms in a city and mean jobs per firm help explaining the structure of economy.

3.3 Data collection methods

3.3.1 Desk research

The first step is building a dataset with information regarding the status of the designation procedure and year of designation, collected from IPHAN's website. Data for the dependent and the control variables are collected from the database of IBGE[3] (2011, 2013, 2017) and other governmental bodies (MMA, 1997, Tesouro Nacional, 2013). The exception of source for collection is foreign direct investments, gathered from FDI Markets (2017). For each heritage and non-heritage city, each indicator is collected and incorporated into the dataset.

3.3.2 Survey

Regarding the collection of data for *SQ3*, a survey was conducted with municipal officers of the heritage cities. A list of management aspects that have been reported worldwide and across Brazilian cities is presented in the operationalization table and steered the elaboration of a questionnaire (Annex 2). It is composed of a set of questions concerning administrative issues and questions aimed at understanding the prioritization of strategies and the relevance of challenges. These are closed-ended questions, to be answered in a scale from 1 (not adopted/ inexistent) to 7 (major strategy/ problem), as the goal of the questions is capturing the importance of each item in relation to the others within each city's context. Displaying seven options in the scale, being three to each side of the median, neutral value, allows for capturing sensible differences across the items. In addition, each question included room for optional, complementary information. The questionnaire was first tested in a pilot assessment to ensure the clarity if questions and after minor adaptations it was sent to respondents.

Aiming at achieving a high rate of response, the questionnaire was formulated as short as possible although capturing the most relevant information. IPHAN has endorsed the research with a letter that was sent along with an introductory note and a link for the on-line survey. The attempt of approaching municipal officers was conducted twice through e-mail and twice through phone calls. Contacts of all heritage cities were collected through institutional websites and support from regional IPHAN's offices.

3.4 Data analysis methods

The analysis starts with managing and preparing the data, as detailed in Annex 1. The process is then conducted through description and inferential analyses explained throughout this chapter.

[3] The Institute is a governmental organization, within the National Ministry of Planning, Development and Management, and conducts systematic research of social, demographic, economic and geographical indicators around the whole territory of Brazil.

3.4.1 Descriptive analysis

The initial phase of analysis is describing the collected data, including charts to visualize such information and provide initial understanding of the analysed indicators. To assess the strength of relationships among variables, a Pearson's correlation is conducted in sequence. These steps aim at enabling the exploration of the data, providing indications for the subsequent steps.

Description is undertaken for all research questions, however more relevant to answer *RQ2*. Initially, an overview is supported by graphs. Relations indicated in the theory review are assessed using cross-tables and bar charts, enabling contrasting such information and identifying initial results. Then, a correlation test is conducted to understand how the prioritization of management strategies and the relevance of challenges relate to the economic indicators assessed in the *RQ1*. Despite not statistically significant, the test enables plausible conclusions for answering *RQ2*.

3.4.2 Inferential analysis

Based on theory and the research questions, the aim of the inferential analysis is to test whether the relations identified among variables are systematic and, thus, unlikely to happen randomly or to be influenced by external factors. The conducted analyses do not infer causality (Van Thiel, 2014).

The core statistical tests are OLS regressions and T-tests, to provide results for *RQ1*. In addition, probit models are used to analyse discrete dependent variables, namely the dummy indicators for the presence or absence of investments (section 4.1.2), indicating the statistical significance and the direction of the relationship between heritage conservation and the categorical DV, as well as coefficients of probability of cities to receive investments when they are heritage. The model is also employed as an alternative to test whether the significance and the directions of the relationships found in the OLS regressions remain, by inverting IV and DV.

3.4.2.1 OLS regression

A series of regression analyses is undertaken for *SQ1*. For each dependent variable, a uni-variate regression is conducted first, expressed by the function:

$$\boldsymbol{Economic\ indicator_i = \alpha + \beta_i\ Heritage\ conservation + \varepsilon_i}$$

Where *economic indicator* represents each of the DVs for city *i*, *heritage conservation* indicates whether city *i* has a conserved heritage ensemble (IV), and β is the coefficient that expresses the effects of a unit change of the IV on the DV.

Subsequent multiple regressions are conducted including the control variables in order to assess the effect of heritage conservation (IV) while taking account of other factors:

$$\boldsymbol{Economic\ indicator_i = \alpha + \beta_1\ Heritage\ conservation + \beta_2\ Control\ variables + \varepsilon_i}$$

Therefore, the coefficient β_1 represents the change on *economic indicator* (DV) of a city *i* related to *heritage conservation* (IV) while holding other factors constant, expressed by a vector of *control variables* that vary according to each model. This analysis informs whether the relationship of each factor on the right side of the function is statistically significant with the economic indicator on the left side of the function, and what the magnitude and the strength of this relationship are, also indicating factors that might act as moderators or mediators.

3.4.2.2 T-tests

By comparing mean values between two groups, the t-test is aimed at identifying whether their difference is statistically significant (Van Thiel, 2014). It is employed to answer *SQ2*, testing

the null-hypothesis of no significant relation between heritage conservation and each type of industry in the dataset, that is rejected or not according to the probability estimates. The types of industries are assessed in two manners:

a. Considering the count of firms in heritage and non-heritage cities, measured by the percentage of each type of industry in relation to the total number;
b. Assessing the difference in count of FDI, classified according to CNAE (IBGE, 2013).

For information on the classification of industries, refer to Annex 1.

3.5 Validity and reliability

Regarding the quantitative part of the research, the attribution problem that might arise from simply assessing economic indicators of heritage cities is overcame by adding a counterfactual situation into the statistical model: a control group (non-heritage cities), and control variables (explanatories of the dependent variables). This enables measuring what is intended to, ensuring internal validity. In addition, the management of data (Annex 1) seeks to transform variables to meet the needed assumptions for the selected analysis method. External validity, in turn, refers to the possibility of generalizing findings – in this research, the sample already comprises the whole of Brazilian cities. Findings could be generalized for designation of heritage ensembles at state or city levels once economic indicators are equal. For similar context such as Latin American cities, for instance, an assessment of economic indicators and heritage conservation conditions would define the possibilities of generalizing results.

Reliability, in the analysis using secondary data, is favoured by the fact that there is no subjective interference from the researcher in measurements, and the sources are official institutions (Van Thiel, 2014). On the other hand, the absence of previous research adopting this methodology prevents the comparison of results among different studies (Rypkema, et al., 2011).

Regarding the survey, the biasness of respondents might arise due to the work institution perspective or political interference, for instance. Besides, responses across cities might not be directly comparable, since each individual tends to score the questions subjectively. To account for that issue, the responses are interpreted by the author when possible, by aligning them to the extra information provided and by analysing consistency within the responses.

The analyses are comprehensible, considering that the procedure is clearly explained, and the assessment is transferable to other cases. Results are plausible for the specific cases of cities that answer, once respondents are officers responsible for heritage management, and were approached with clarifying instructions to provide accurate information. Overall findings are potentially able to be transferable to a certain extent, and more responses can be raised in the future. However, the generalization ability is limited due to the number of responses, preventing a statistical analysis that could identify structural relations and thus externally valid results.

Chapter 4: Research Findings

The classification of cities originated the following groups:

	Frequency	Percent
Non-heritage cities	5,459	98.01
Designated heritage cities	71	1.27
Total	5,530	100

Table 4 - Groups of cities in the sample

As described in section 3.1.1, cities are classified in two groups: cities designated as heritage until 2010 (meaning that IPHAN has officially designated the conservation of an urban ensemble) and non-heritage cities, excluding 40 cities that are either under analysis by IPHAN or were designated after 2010. Total numbers are displayed in Table 4.

The presentation of findings is organized according to the research questions, thus structured as follows:

4.1 RQ1: Relationship between heritage conservation and economic performance:

- **4.1.1** SQ1.1: Overall economic indicators;
- **4.1.2** SQ1.2: Investments attractiveness;
- **4.1.3** SQ1.3: Types of industries;

4.2 RQ2: Relationship between governance factors and economic indicators.

By the end of the chapter, section **4.3** discusses the findings.

4.1 Findings for *RQ1*

4.1.1 *SQ1.1*: Overall economic indicators

An initial comparison of the overall economic indicators (DV) across the groups: all cities, the heritage and non-heritage ones is displayed in Figure 1.

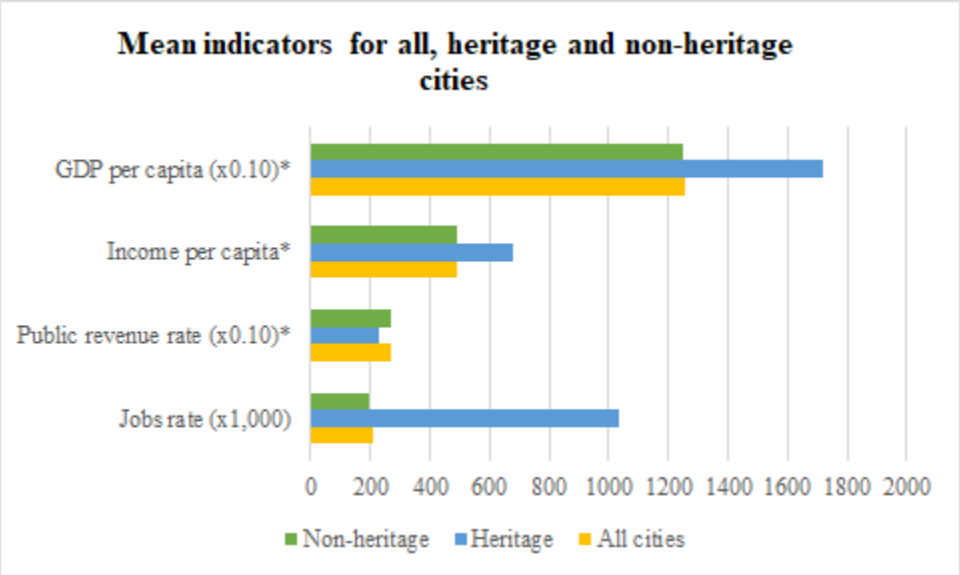


Figure 1 - Description of economic indicators across the groups of cities. *values in R$

The graph above shows a variance of performance among indicators. Confirming expectations from the literature review, the mean values of GDP per capita, income per capita and jobs rate are higher in heritage cities than in non-heritage ones, although with different magnitudes. The comparison of the first indicator shows a value approximately R$4,500 (35%) higher in heritage cities. It may reinforce the arguments of Throsby and Bakhshi (2010) and Rypkema (2014) that activities leveraged by heritage conservation, such as employment, enterprises and further externalities contribute to the overall economic growth. In the same year, income per capita was nearly R$200 (40%) higher, and the ratio of jobs, four times larger (difference of 0,842 per inhabitant) in heritage cities. Such differences are aligned with the argued increase in work opportunities in different sectors, also linked with the supposed enhanced attractiveness of investments by heritage conservation.

A negative aspect for heritage cities is identified in the lower mean of public revenue, approximately R$400 (15%) different between the two groups of cities. It shows an opposite perspective from the argument presented by Rypkema (2014). Such result may relate to different dynamics of property values than identified in the literature review. In that sense, it is possible that heritage protection policies do not increase property values in Brazil, or that the rise is less significant than when land is available for redevelopment, for instance, yielding less revenue from land taxes. The economic structure of heritage cities, to be further analyzed, may also impact tax revenues due to a varied development of industries that contribute to public revenue is different proportions.

The complete table of descriptive statistics can be found in Annex 3.1, as well as the correlation analysis results.

	GDP per capita			Income per capita			Public revenue			Jobs (rate)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Designated heritage conservation	0.168***	0.062	0.086	0.201***	0.277***	0.129***	-0.147***	-0.054	0.134	0.398***	0.389***	0.330***
	(0.057)	(0.056)	(0.147)	(0.028)	(0.064)	(0.043)	(0.052)	(0.052)	(0.107)	(0.078)	(0.103)	(0.105)
Proximity index	1.366***	0.074	-0.331	2.185***	2.948***	0.015			-0.638	1.966***	1.506*	0.358
	(0.182)	(0.197)	(1.214)	(0.91)	(0.421)	(0.355)			(0.886)	(0.247)	(0.677)	(0.869)
Coastal city	0.198***	0.164***	0.116	0.084***	0.050	0.011	-0.078***	-0.057**	0.217**	0.161***	0.064	0.049
	(0.028)	(0.027)	(0.128)	(0.014)	(0.057)	(0.037)	(0.025)	(0.025)	(0.093)	(0.038)	(0.092)	(0.091)
Domestic investment	0.449***	0.378***	0.823***	0.218***	0.297***	0.159***	0.228***	0.282***	0.702***	0.421***	0.688***	0.634***
(rate) (x100,000)	(0.013)	(0.014)	(0.120)	(0.006)	(0.052)	(0.035)	(0.012)	(0.013)	(0.088)	(0.018)	(0.083)	(0.086)
FDI count (rate)			0.119**		-0.060***	-0.019			0.155***		-0.003	0.012
(x1,000,000)			(0.047)		(0.020)	(0.013)			(0.034)		(0.033)	(0.033)
Higher education		0.289***	-0.016			0.489***		-0.180***	-0.131			0.191**
(rate) (x1,000)		(0.019)	(0.129)			(0.037)		(0.016)	(0.094)			(0.093)
Federation state	---	---	---	---	---	---	---	---	---	---	---	---
N	4,220	4,220	146	4,220	146	146	4,266	4,266	146	4,218	146	146
R^2	0.597	0.618	0.672	0.780	0.810	0.921	0.409	0.426	0.725	0.400	0.685	0.695

Table 5 – OLS regression results for SQ1.1 – Overall economic indicators

p-values: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Dummy variables' references are non-heritage and non-coastal cities

--- : accounted for federation state

Table 5 displays the most relevant results only. The univariate regressions were conducted however not reported as the heritage factor behaves similarly to the presented results. Significant relations are identified between heritage conservation (IV) and economic indicators (DV), even when controlling for external factors. Due to this significance, the initial analysis of each model reported in the table already considers a set of control variables. The significance of the main independent variable tends to weaken, and coefficients tend to decrease as more control variables are added into the analyses. Regressions are reported according to relevant changes in the relationships, attempting to identify intermediating factors.

When controlling for region, accessibility, natural attractiveness and domestic investments (1), the change in GDP per capita from non-heritage to heritage cities is 16.80%, indicating higher consumption and production of wealth in the latter group. The significance of heritage for GDP ceases in two occasions: One, when human capital is accounted for (2). This indicator presents a significant relation with the DV, however, loses strength in the next model, when FDI is included (3) and shows a significant relationship with the DV. It is interesting to note that domestic investment is permanently significant and will be discussed in the next section.

Looking at the effects on income per capita, the factor heritage is significant across all scenarios. The coefficient of increase of the DV when the city is heritage designated starts from 20% while controlling for the primary factors as explained above (1), changing to 27.70% and to 12.90% while accounting for FDI (2) and education (3), respectively. Analysis 2 also shows that the relation between FDI count and income per capita is negative, thus increasing the coefficient of heritage conservation. Until this stage, it may be inferred that the count of FDI affects income in the opposite direction than it affects GDP, indicating that the wealth generated by it does not benefit households in average, and suggesting that FDI sectors attracted to heritage cities are unlikely to be labor-intensive. Analysis 3 shows the ratio of highly educated population as a major determinant of income per capita, canceling the significance of FDI however only decreasing the coefficient of heritage conservation. It may indicate that education performs a moderating role between heritage conservation and income.

Regarding public revenue, the negative trend identified in figure 1 is confirmed and significantly impacted by the heritage factor when controlling for natural attractiveness, domestic investment, and region (1). Heritage cities collect 14.70% fewer taxes than non-heritage cities, an aspect that may be related to dynamics in property values and predominant types of industries. Assessing the change in relations in analysis 2, it is inferred that the ratio of higher educated population is significantly related to public revenue and cancels the strength of the heritage factor. The direction of the relationship, negative, might indicate an explanatory, partial channel between the main IV and the DV, as well as reinforce the possibility that the structure of the economy of heritage cities, largely associated with education levels, may help to explain the difference in public revenue. Lastly, analysis 3 considers FDI rate, highly significant for public revenue, possibly indicating another explanatory channel. Besides, it cancels the significance of education, again indicating that types of industries may largely explain the outcomes.

According to the last model of Table 5, it can be inferred that the rate of jobs is significantly, positively and permanently related to heritage conservation across the analyses. Analysis 1 shows a change of 39.80% in the ratio of jobs per population when the city is heritage-designated, accounting for the first set of control variables. This coefficient slightly decreases with the addition of FDI to the analysis (2), being however not significant, and with higher education (3). From the latter, the relevance of heritage designation, domestic investment, and higher education indicates the possibility that the majority of jobs are supplied by highly-skilled types of firms, present in heritage cities in larger amount (section 4.1.3).

4.1.2 SQ1.2: Investments attractiveness

Due to the high number of cities without investments and, thus, the non-normal nature of the data, this analysis is divided into two sub-analyses. The first assesses the relations between heritage conservation and the presence of investments, for which observations are simply classified as 0 or 1, the latter referring to cities that receive investments, regardless of the quantity. The second assesses effects of heritage conservation only in cities that receive investments, and the count and the value are compared between non- and heritage cities. Annex 3.2 presents the description and the correlation of data of this section.

An initial description of cities receiving investments yields the following figure:

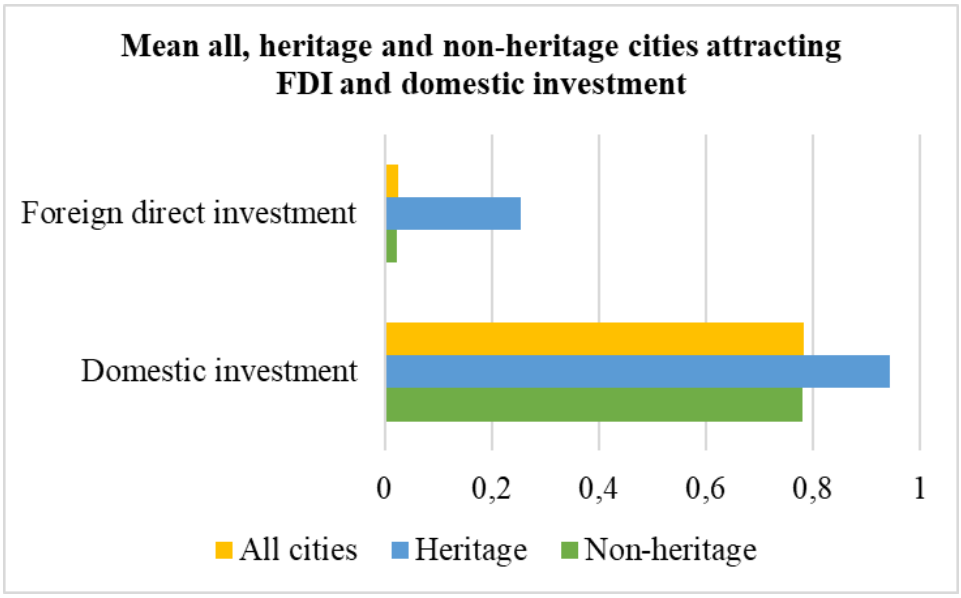


Figure 2 - Description of dummy investments variables – mean cities attracting investments per group

Figure 2 displays a greater average of cities attracting both foreign and domestic investments in the heritage group. Approximately 25% of heritage cities attracted FDI between 2010 and 2016, against 2,1% of non-heritage cities. Naturally, cities that attract domestic investments are more numerous than FDI, nevertheless, heritage ones also represent a higher mean: approximately 94% received investments until 2010, compared to approximately 78% of non-heritage cities.

In sequence, a probit regression is conducted, as the DV are categorical, which results are displayed in Table 6. Coefficients are determined by the marginal effects.

	FDI after 2010		Domestic investment until 2010	
	(1)	(2)	(1)	(2)
Designated heritage conservation	0.075***	0.019*	0.238***	-0.023
	(0.010)	(0.009)	(0.071)	(0.079)
Population		1.17e-07***		0.0001***
		(2.86e-08)		(6.90e-07)
GDP		2.23e-10		
		(6.61e-10)		
Proximity index		0.003***		
		(0.0005)		
Higher education		1.43e-07		
		(2.81e-07)		
Federation state		---		---
N	5,530	5,434	5,530	5,530
pseudo R^2	0.043	0.410	0.0025	0.169

Table 6 – Probit regression results for SQ1.2 – Dummy investments indicators

p-values: * p < 0.1; ** p < 0.05; *** p < 0.01.

Dummy variables' references are non-heritage and non-coastal cities

--- : accounted for federation state

It is possible to infer that the heritage factor is significantly and positively associated with the presence of FDI in Brazilian cities. When solely assessed (1), being designated as heritage increases the probability for a city of being in the group that receives FDI by 0.075. Controlling for city size, GDP, accessibility, human capital and region (2), heritage conservation maintains a positive relationship with FDI, although with a weaker significance. In this case, being in the heritage group increases the probability of attracting FDI by 0.019 at 90% confidence levels. Such result is aligned with the attractiveness argument discussed in the literature, which means that cultural and unique characters conserved in heritage may influence the location choice of foreign companies, which may be reinforced by marketing strategies.

The dynamics of domestic investments vary from the foreign ones, as the majority of Brazilian cities have received the former until 2010. The probit regression results show that heritage designation significantly increases the probability of attracting domestic investments by 0.238 (1). However, when holding city size and region constant, the heritage factor is no longer significant (2). Therefore, various other factors may explain, to a larger extent, the city choice by national enterprises. It is important to observe that, since the data available for domestic investments comprises the number of attracted firms until 2010, it is not possible to define whether cities were designated before or after the investments. Therefore, the captured effects refer to the conservation of heritage however not necessarily the official designation of it.

The second subanalysis disregards cities that do not receive investments, in order to assess differences in count and value, and adopts the ratio between investments and population as the dependent variables to account for differences in city sizes.

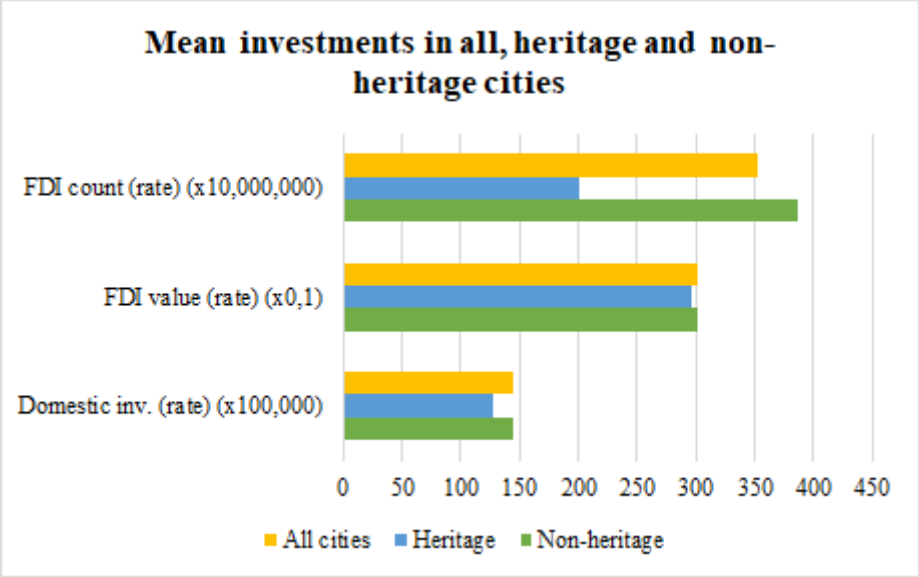


Figure 3 - Description of mean FDI and domestic investments across the groups of cities

The initial descriptive assessment in Figure 3 shows differences between groups of cities that contradict expectations from the reviewed literature and from the previous subanalysis. When assessing only cities that attract investments, domestic and FDI count and value are lower in heritage than in non-heritage cities. The first section shows the ratio of FDI count 42% smaller and the FDI value ratio, approximately 2% smaller. A possible explanation may be related to the type of foreign investment being predominantly different between the two groups of cities: perhaps FDI in heritage cities are less numerous however proportionally larger in value, which could be related to costly, industrial or other labor-intensive plants. The ratio of domestic investments is approximately 10% smaller in heritage cities, indicating that the heritage conservation factor may be insufficiently effective in attracting firms, or that different types of industries also react differently between the two groups.

The following OLS regression is conducted to identify statistical relations:

	FDI count (rate) (x1,000,000)		**FDI value (rate)**		**Domestic investment (rate) (x100,000)**	
	(1)	(2)	(1)	(2)	(1)	(2)
Designated heritage conservation	-0.799**	-0.0642	-1.150*	-1.142	-0.384***	-0.108*
	(0.332)	(0.326)	(0.622)	(0.647)	(0.064)	(0.056)
GDP per capita	0.366*	0.512***	0.558	0.757**	0.541***	0.396***
	(0.187)	(0.169)	(0.350)	(0.336)	(0.014)	(0.014)
Higher education (rate) (x1,000)		-1.169***		-1.601***	0.448***	0.282***
		(0.215)		(0.426)	(0.017)	(0.017)
Federation state	---	---	---	---		---
N	138	138	138	138	4,328	4,328
R^2	0.344	0.483	0.186	0.279	0.562	0.676

Table 7 – OLS regression results for SQ1.2 – Investments indicators

p-values: * p < 0.1; ** p < 0.05; *** p < 0.01.

Dummy variable's reference is non-heritage cities

--- : accounted for federation state

Simple regressions between heritage conservation and the DV are not reported due to the insignificant result of the main IV. Table 7 confirms that the heritage factor is significantly, negatively related to investments attractiveness. Considering the count of FDI, when controlling for GDP and federation state (1), being in the heritage group decreases practically 80% of the number of investments. The magnitude is greater than in Figure 3 probably due to the positive effect of the control variables on the DV. When also considering higher education rate (2), the significance of heritage conservation is canceled, which indicates that the relationship between heritage and FDI attractiveness may be mediated by higher education levels. A similar dynamic is identified in the model considering FDI value as the outcome variable. While GDP per capita is positively related to the value of attracted investments, the proportion of the highly educated population is significantly, negatively related to the indicator, and with a greater magnitude (1 and 2). This may reinforce that the types of foreign investments differ in heritage cities, perhaps prioritizing cities with lower levels of education (and unskilled labor), or simply that heritage conservation fails to fulfill its attractiveness potential. Finally, the third analysis shows a permanent, negative significance of heritage conservation in relation to the ratio between the count of domestic investments and population. Holding GDP per capita and higher education rate constant (1), the change from non-heritage to the heritage group of cities implies a 38,4% decrease in such kind of investments. When controlling for regions, the coefficient decreases to 10,8%, and the significance to 90% confidence levels (2), and the other two variables are still significantly related to investments. A difference from the foreign investments model is identified in the direction of the effects of the higher education rate, which is now positive. The negative relationship between heritage conservation and domestic investments may be influenced by factors different than the ones tested or may be connected to attractiveness being further developed in non-heritage cities, hindered by heritage conservation or not effectively managed in heritage cities.

These results may also explain the negative relationship between heritage conservation and public revenue. As in section 4.1.1, they appeared to be positively related, tax collected may be hindered by the low attractiveness of heritage cities.

4.1.3 SQ1.3: Types of industries

Aimed at identifying significant differences in the structure of the economy between non-heritage and heritage cities, t-tests are conducted to assess the share of each type of firm in each city (first section) and the types of attracted FDI (second section) by the two groups of cities. As the previous assessment, only cities that receive investments are considered, therefore results are not distorted by a relevant quantity of cities with zero investments. The table of complete summary statistics is found in Annex 4.3.

Only significant differences ($p < 0.1$) are shown in the following table:

	mean Heritage	mean Non-heritage	mean Difference	Std. Err. Diff.	p-value
Share of kinds of firms					
A - Agriculture	0.953	3.522	-2.568	1.055	0.015
C- Transformation industry	6.512	7.953	-1.441	0.782	0.065
F - Construction	3.361	2.078	1.282	0.239	0.000
G - Commerce	44.766	49.522	-4.755	1.465	0.0001
I - Accommodation and restaurants	9.394	4.916	4.478	0.496	0.000
J - Information and communication	1.582	0.856	0.725	0.023	0.000
K - Finance and insurance	0.679	0.348	0.330	0.087	0.000
L - Real estate	0.590	0.202	0.387	0.053	0.000
M - Scientific and technical	3.018	1.917	1.101	0.218	0.000
N - Administration and related services	6.602	2.565	4.036	0.306	0.000
O - Public administration	0.635	2.254	-1.618	0.350	0.000
Q - Health and social care	2.108	1.456	0.651	0.172	0.000
R - Arts, culture and recreation	1.506	1.015	0.491	0.165	0.003
S - Other services	10.468	13.497	-3.029	1.287	0.018
N	71	5,454			
FDI count by kind					
H - Transportation and storage/logistics	0.764	0.25	0.514	0.186	0.006
I - Accommodation and restaurants	0.235	0.016	0.4218	0.074	0.003
J - Information and communication	2.235	0.625	1.610	0.529	0.002
K - Finance and insurance	0.764	0.075	0.689	0.107	0.000
N - Administration and related services	0.764	0.233	0.531	0.246	0.033
N	17	120			

Table 8 - T-tests results for SQ1.3 - Types of industries

The first section shows that, from the 14 types of industries that presented significantly different means, in five kinds such differences are negative: agriculture, transformation industry, commerce, public administration, and other services.[4] Despite no definitive

[4] Other services (CNAE): composed of personal services, associative services of companies, unions, religious and political organizations.

conclusions can be drawn, the lower share of organizations related to public administration may be related to lower public revenues in heritage cities, meaning the size of the public sector in such cities is less representative in the total amount of firms. The four percentage points less in the commercial activities share predict that this activity is less relevant among the whole of firms in heritage cities. Construction activities present a higher share related to heritage, as mainly regeneration strategies demand civil works (Rypkema, et al., 2011, Labadi, 2016).

The structural economic changes that occur from conserving heritage, according to Florida (2002), suggests an explanation for the lower percentage of agriculture firms and transformation industries, and the higher share of firms related to communication, real estate, finance, and administrative services, typically related to the presence of highly-skilled workers. Furthermore, the strongest economic argument for heritage conservation is confirmed: a higher share of firms related to accommodation and restaurants, arts, culture and recreation (Rypkema, et al., 2011, Throsby, 2012, O'Brien, 2012, UNESCO, 2016, Labadi, 2016, Sandholz, 2017).

The second section of Table 8 shows differences in mean count of FDI after 2010. All significant results are positive in heritage cities and may be explained by the same reasons of the positive differences in domestic investments. Unexpectedly, the arts, culture and recreation sector does not show a significant difference, that may relate with the low total number of investments of such kind.

4.2 Findings for *RQ2*

The process of collecting data through the online questionnaire started by searching contacts of public officers, via websites and by contacting IPHAN regional offices. Questionnaires were sent to all 111 cities that are either designated or undergoing the legal process to be designated, along with a letter of support by IPHAN's general coordinator. A reminder e-mail was sent, and at least two other attempts of contact were conducted through phone calls. A total of 31 cities responded to at least one part of the questionnaire, and this rate varied across the sections, as can be seen in the descriptive table in Annex 4. Although not representative of all designated heritage cities in Brazil, the quantity of responses provides plausible information from cities of various sized and regions.

The activity of collecting contacts and responses through the online survey provided fruitful indications of management conditions:

- Heritage ensembles are under the responsibility of culture departments in the majority of heritage cities;
- In some cases, IPHAN's local office is responsible for management;
- A meaningful number of cities – 23, declared not having an organized database about relevant management information such as yearly expenditure on conservation or ownership of properties, either by responding that the information was unavailable or by simply not replying the related questions.

Such aspects reinforce the problematic governance and the necessity of an integrated management plan stressed by Roders and Van Oers (2011) and by Sandholz (2017). The authors indicated the knowledge of the site and the monitoring of results in a continued way as critical factors. Urban planning bodies have the formal task of properly managing urban areas, and this should include the heritage ones, while cultural departments should usually hold other functions.

Administration and related services: firms supporting the administration of other companies and organizations.

The initial questions aimed at providing an overview of governance conditions to understand the treatment provided to heritage areas, although relations with economic indicators may not be directly inferred or possible relationships are yet unknown. Results are presented in the following figures:

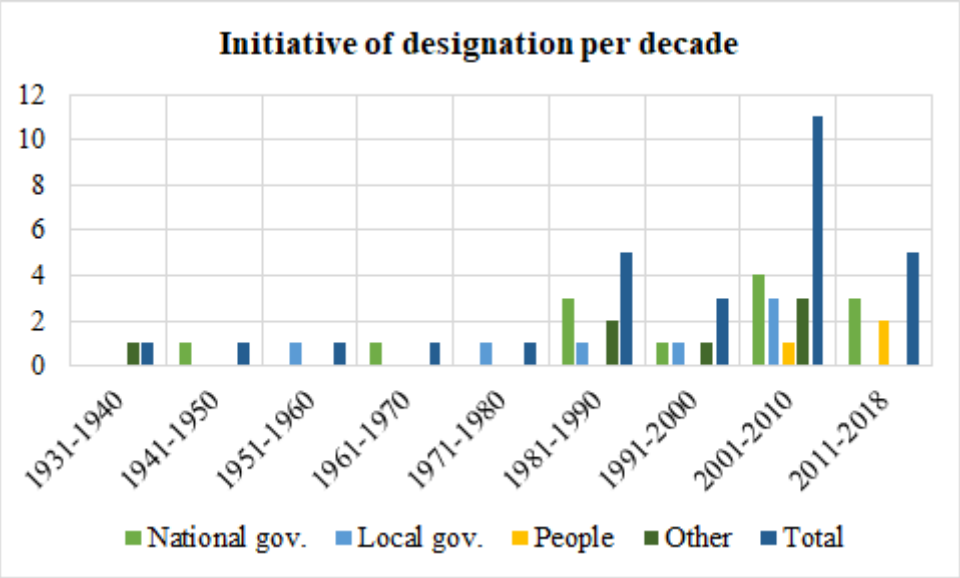


Figure 4 - Initiative of designation in number of cities

Figure 4 describes which entity initiated the official designation process over the past decades. As described by Sant'Anna (2017), the majority of processes were formerly started by IPHAN, and localized and popular manifestations in that sense are more recent, which is confirmed in this survey. The sense of ownership and the willingness of protecting heritage by the citizens potentially influence the development of such areas, as integration favors utilizing the existing structures as assets. Top-down decisions, on the contrary, were largely made against the popular compliance and favor facing such areas as hindrances for development. It is expected, thus, that recently designated cities prosper better from protected areas, as they are more likely to be integrating heritage in development plans. It can also be seen that the majority of cities responding to the questionnaire were designated between 2001 and 2010.

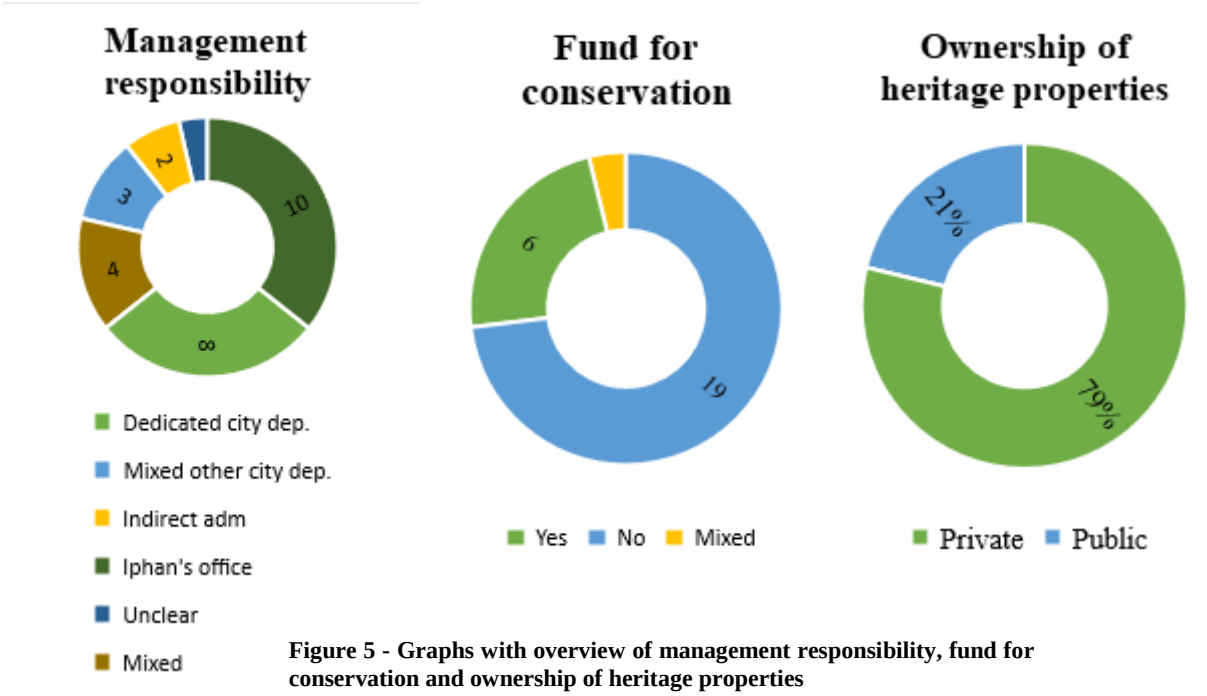


Figure 5 - Graphs with overview of management responsibility, fund for conservation and ownership of heritage properties

Figure 5, above, displays graphs with a variety of management aspects. It can be inferred, from the first graph, that the accountable bodies for managing conserved areas significantly vary across cities, as the designation and administrative structure have developed differently, according to each city's context. In a few cases, there is no clarity on each body's role.

Regarding funds for conservation, indicated by Rama (2012) as an instrument to ensure resources for conservation, the second graph shows that the majority of responding cities have not implemented a specific fund. Complementary information provided by respondents indicate that the formal constitution of a fund is highly bureaucratic, time-consuming and vulnerable to change of political mandates, implicating this instrument may not enable resources effectively and continuously.

Furthermore, governance aspects of conservation vary according to the ownership of heritage-designated properties, and different strategies apply to private and public ones. The former demands the accordance of the owner in protecting, and usually deploys incentives and regulations, however, does not allow for direct intervention from the government. Opposingly, public properties are usually not subject of [un]willingness of protection, however, their conservation demands availability of public resources for interventions and the capacity of adapting uses is limited. For instance, private residential use is not possible. The third graph shows that the majority of protected properties are privately-owned, which may indicate a relevant prioritization of strategies for incentives and regulations, and unwillingness to protect as a significant challenge. Such aspects, in turn, may influence the economic outcomes from heritage conservation.

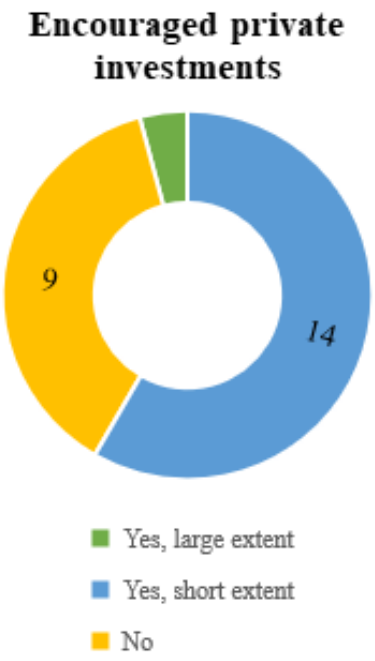


Figure 6 - Encouraged private investments

When questioned about relevant investments in heritage areas, 12 respondents provided values and sources, the majority of investments being enabled by the national government. Values ranged from R$ 100,000 to R$ 11 million and were employed on various types of intervention, such as refurbishment, restoration, and infrastructure of historical properties and urban areas. Connected to that, as shown in Figure 6, 15 cities answered that public investments do encourage individual, private employment of resources on properties conservation, compared to 9 cities where this effect did not happen. This indicates that major investments are both directly beneficial to the object of intervention and for sustaining conservation during time through reactive investments by other actors.

24 cities provided responses to the strategies adopted for conservation and their relevance in relation to each other. Scores of all cities for each strategy are summed up in the following figure:

Figure 7 - Sum of scores to the relevance of each management strategy

According to Figure 7, marketing using heritage as the subject is a strategy adopted in various cities and with high priority, indicating that city managers understand the attractiveness potential of such asset. Integration of heritage conservation into urban regulations appears as the second most important strategy, which means the protected urban areas have been acknowledged as part of the urban fabric, as recommended by UNESCO (2016). Next to that, regeneration and rehabilitation of heritage properties stand among the most important approaches, indicating efforts towards improving the existing structures and the acknowledgment of the necessity of enabling such structures to accommodate current needs. Also important, awareness and public participation have been embraced in heritage management probably as a recognition of the cruciality of public opinion and ownership. In this regard, eight cities complemented the question with the information that the majority of the population does not acknowledge the values of heritage, especially inhabitants of protected areas, and that the conservation is hindered by the lack of publicizing information and the unwillingness of the population to protect it. With similar intermediate importance, leveraging public and private investments often represent means of enabling interventions, and perhaps the relatively low scores may indicate a lack of prioritization. On the other hand, ensuring the availability of resources is fundamental in sustaining conservation, and not prioritizing such action may represent a problem for medium- and long-term conservation.

The four strategies that imply the formulation of specific, strict land regulations stand as the least prioritized ones. The low encouragement of residential uses may be related to the decentralization trend of urbanization processes in Brazil, in which commercial and services tend to settle within the central regions, often with higher property prices, and residential uses are either push out by such prices or by the willingness of families to leave in the suburbs. Furthermore, respondents state that, in many cases, traditional families owning the historical properties live in such properties yet. Therefore, encouraging this use is not necessary. In the cities where this strategy has been prioritized, regulations are either being formulated or have been only recently implemented, therefore it is not a traditional approach to heritage areas yet. Although it is widely recognized that social housing should be provided in city cores, this rarely occurs in Brazilian cities due to an array of issues, and the results show the trend is similar in heritage cities. Similarly, compulsory use and transfer of development rights are still rarely employed in urban regulations. Despite being embedded in the Brazilian Constitution, only recently they started to be utilized as legal instruments to enable the proper and fair use of the urban land. Even more recently, they have been adopted as strategies to avoid the decay of historical structures and to compensate property owners for unexplored construction potential of protected properties. As extra information, four cities reported adopting land tax exemption, of either 100% or 70% in the total value, as a compensation to protected properties that continuously contribute to heritage ensembles by maintaining their own properties in a proper condition. This is an action of relative easiness of formulation, politically favorable as it compensates owners, therefore suitable for compensating the losses of protected buildings. On the other hand, the medium- and long-term financial capacity of a given city may be hindered, once the land tax is one of the main sources of public revenue in Brazilian cities (Afonso, et al., 2012). This may also indicate a path for further exploring reasons for the negative results for public revenue in section 4.1.1.

Complementary suggestions provided by respondents included enabling public-private partnerships for conservation.

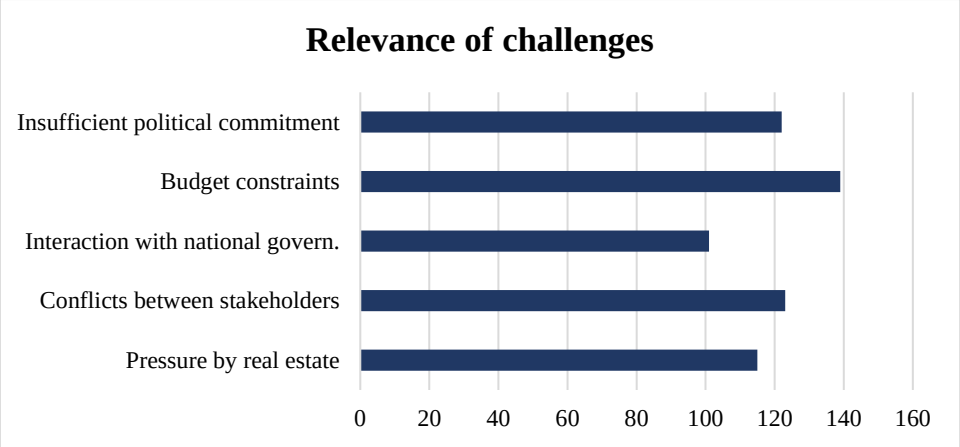


Figure 8 - Sum of scores to the relevance of each management challenge

Figure 8, above, summarizes the scores given to the relevance of problems that hinder heritage conservation. This section of the survey was responded by 25 cities and the scores show that all posed challenges are relevant to heritage management. The barrier that outstands in comparison to the others is budgetary constraints. Despite financial resources have rarely been sufficient in all municipalities in Brazil, the employment of public revenue has to be prioritized by local managers in specific sectors, and this result suggests that heritage conservation is not among prioritized sectors. Related to that, the insufficiency of political commitment is one of the second most relevant issues and also reflects the lack of prioritization indicated by the main challenge. This relates to the vulnerability of heritage conservation to political influences. Also in the second place, opposing interests from different stakeholders represent a problem for management, perhaps reflecting the unwillingness of protection by property owners or confirming the insufficient understanding of potentials for development. The pressure exerted by real estate activities is also relevant, however to a shorter extent, partially confirming the statement by Sandholz (2017) that this would be the main force justifying the neglection of heritage. Nevertheless, this problem may also support the relevance of previous ones, as conflicting interests and insufficient political commitment can be related to opportunities seen in new real estate developments. The least relevant of the five assessed problems is the interaction with the national level of government. This indicates that issues related to the management at the local scale may be threatening heritage to a larger extent. Nevertheless, if this interaction were beneficial, perhaps other problems would be lessened, such as lack of resources and unwillingness of protection. Additionally, five municipalities reinforced, through adding comments within the questionnaire, the necessity of financial support and transparency of actions by IPHAN.

The analysis proceeds by assessing correlations among strategies and challenges with the economic indicators of *RQ1*. The dependent variables of *SQ1* and *SQ2*, except for FDI due to a low number of observations and a selection of the most relevant ones of *SQ3* are considered. This stage considers only the cities officially designated until 2010, therefore the number of observations is 16. Despite being insufficient for a reliable statistical analysis, the correlation test is nevertheless conducted to meet the proposed methodology and provide indications for future assessments.

	GDP per capita	Income per capita	Revenue (ratio)	Jobs (ratio)	Domestic invest. (rate)	Firms_F_construction	Firms_G_commerce	Firms_I_tourism	Firms_N_admin&other	Firms_O_publicmanag	Q10 Urban regeneration	Q11 Integ. urban regulations	Q12a Compulsory use	Q12b Transfer of devel. rights	Q13 Rehab./ adaptive reuse	Q14 Promotion of housing use	Q15 Social housing	Q16 City marketing	Q17 Public investments	Q18 Encourag. Pvt. Invest.	Q19 Public participation	Q20 Broad awareness	Q22 Insuf. political commit.	Q23 Budget constraints	Q24 Interaction national gov.	Q25 Confl. stakeholders	Q26 Pressure by real estate
GDP per capita	1																										
Income per capita	0.692	1																									
Revenue (ratio)	0.836	0.341	1																								
Jobs (ratio)	0.682	0.867	0.397	1																							
Domestic investments (rate)	0.509	0.361	0.327	0.153	1																						
Firms_F_construction	-0.015	0.355	-0.215	0.256	-0.214	1																					
Firms_G_commerce	-0.830	-0.834	-0.601	-0.845	-0.301	0.023	1																				
Firms_I_tourism	0.258	-0.208	0.338	0.103	-0.053	-0.331	-0.183	1																			
Firms_N_admin&other	0.455	0.645	0.230	0.743	-0.293	0.356	-0.720	0.007	1																		
Firms_O_publicmanag	-0.002	-0.417	0.066	-0.549	0.365	-0.496	0.250	-0.031	-0.389	1																	
Q10 Urban regeneration	-0.020	-0.250	0.132	-0.301	-0.114	-0.313	0.033	0.190	-0.068	0.421	1																
Q11 Integration to urban regulations	0.121	-0.151	0.244	-0.145	-0.168	-0.297	-0.122	0.100	0.163	0.460	0.830	1															
Q12a Compulsory use	-0.301	-0.389	-0.313	-0.241	-0.583	-0.005	0.183	0.237	0.192	0.146	0.566	0.556	1														
Q12b Transfer of development rights	-0.495	-0.610	-0.324	-0.302	-0.597	-0.201	0.372	0.432	-0.017	0.039	0.328	0.302	0.602	1													
Q13 Rehabilitation/ adaptive reuse	0.045	-0.044	0.035	0.120	-0.252	0.180	-0.076	0.060	0.434	0.152	0.367	0.383	0.457	0.249	1												
Q14 Promotion of housing use	-0.043	-0.074	0.054	0.035	-0.494	0.062	-0.092	0.074	0.390	-0.069	0.508	0.637	0.456	0.321	0.640	1											
Q15 Social housing	-0.237	-0.351	-0.108	-0.142	-0.559	0.012	0.093	0.214	0.252	0.036	0.550	0.489	0.805	0.661	0.634	0.565	1										
Q16 City marketing	-0.124	-0.311	0.068	-0.238	-0.342	-0.438	0.055	0.163	0.079	0.351	0.752	0.814	0.434	0.600	0.280	0.606	0.450	1									
Q17 Public investments	0.306	0.092	0.297	0.032	0.091	-0.240	-0.307	0.193	0.238	0.423	0.710	0.756	0.204	0.222	0.394	0.563	0.288	0.769	1								
Q18 Encouragement of private investment	-0.187	-0.187	-0.139	0.014	-0.735	-0.130	-0.019	0.228	0.389	-0.111	0.432	0.492	0.655	0.488	0.462	0.776	0.569	0.601	0.353	1							
Q19 Public participation	-0.094	-0.361	0.001	-0.195	-0.287	-0.074	0.337	0.177	-0.116	0.256	0.459	0.395	0.422	0.278	0.506	0.474	0.309	0.412	0.242	0.550	1						
Q20 Broad awareness	-0.129	-0.286	0.023	-0.294	-0.216	-0.271	0.111	0.160	-0.109	0.297	0.827	0.664	0.445	0.257	0.456	0.675	0.510	0.650	0.665	0.605	0.540	1					
Q22 Insufficient political commitment	0.006	0.179	-0.081	-0.116	0.484	0.372	0.161	-0.399	-0.358	-0.056	-0.335	-0.430	-0.412	-0.648	-0.411	-0.548	-0.574	-0.675	-0.531	-0.742	-0.314	-0.494	1				
Q23 Budget constraints	-0.253	-0.153	-0.329	-0.058	-0.210	-0.251	0.102	0.053	0.122	0.317	0.278	0.182	0.321	0.448	0.310	-0.035	0.247	0.431	0.317	0.310	0.216	0.256	-0.517	1			
Q24 Interaction with national govern.	0.218	0.001	0.279	-0.004	0.194	0.060	0.110	-0.164	-0.248	0.119	0.290	0.190	0.069	-0.224	0.143	-0.039	0.121	-0.024	-0.007	-0.130	0.433	0.249	0.165	-0.103	1		
Q25 Conflicts between stakeholders	0.026	0.040	0.056	-0.067	0.134	0.193	0.147	-0.229	-0.333	-0.099	0.048	-0.139	-0.064	-0.463	-0.051	-0.136	-0.025	-0.385	-0.262	-0.156	0.127	0.265	0.310	-0.226	0.730	1	
Q26 Pressure by real estate	0.174	0.268	0.104	0.376	-0.231	-0.179	-0.456	-0.020	0.500	-0.107	0.294	0.273	0.453	-0.004	0.398	0.293	0.516	0.116	0.064	0.497	0.133	0.286	-0.384	0.231	0.132	0.140	1

obs=16

Table 9 - Correlation analysis output for RQ2 – governance factors and economic indicators

Legend

- very strong positive relationship (r=+.70 or higher)
- strong positive relationship (r=+.40 to +.69)
- moderate positive relationship (r=+.30 to +.39)
- weak positive relationship (r=+.20 to +.29)
- no or negligible relationship (r=+.01 to -.19)
- weak negative relationship (r=-.20 to -.29)
- moderate negative relationship (r=-.30 to -.39)
- strong negative relationship (r=-.40 to -.69)
- very strong negative relationship (r=-.70 or higher)

The correlation analysis results are displayed in Table 9 and identified an array of relationships that are either aligned or contradicting the literature review, and some that may help explaining the results of the previous sections. The correlations between governance factors and independent variables of *RQ1* are highlighted with a thicker outline.

Starting with the strategies, the majority of negative relationships with the economic indicators is clearly visible. Urban regeneration is weakly and moderately related to income per capita, the ratio of jobs and the share of construction firms, challenging Rypkema's argument that this type of strategy would favor construction activities, jobs and, consequently, income for the population of heritage cities. A plausible explanation may be the fact that, often and especially in smaller-sized cities, such kind of intervention is outsourced by the municipalities, which are obliged to publicize the procurement process and, consequently, procured firms are often based at different cities than the activity place. Despite results in section 4.1.3 showing construction firms as a bigger share of the economic structure in heritage cities, this result indicates that regeneration is unlikely to be favoring such results. An additional reason may be related with construction activities being leveraged mainly within the protected area, insufficient to affect the city-wide indicators, especially in larger cities, while preventing contemporary development to take place, generating proportionately more jobs and encouraging construction firms to settle. A strong, positive relationship is identified between regeneration and the share of public administration firms, perhaps due to the fact that this action involves various properties and collective structures, demanding a certain level of coordination by the public sector and thus more likely to happen when the presence of public organizations is more meaningful.

Similarly, the latter argument may also explain the positively strong relationship between integration of heritage ensembles to urban regulations and the share of public organizations. Among the economic overall indicators, such strategy positively relates to the ratio of public revenue, perhaps for the reason that a municipality that is capable of holistically regulating its territory is also capable of planning the development of the city and, consequently, improving tax collection. The inverse relation is also possible: a greater significance of the public sector is enabled in cities with higher revenue.

The land instruments of compulsory use and transfer of development rights have a similar trend; however, the latter's relationships are stronger. They appear to be negatively correlated to all economic indicators, and positively to the share of commercial and touristic firms. A possible explanation for the latter may be that cities that sufficiently embrace heritage to the extent of developing a sophisticated land regulation are likely to fulfil its potential to leverage tourism activities.

Rehabilitation of heritage structures is negatively correlated to the ratio of attracted domestic investments, however positively related to the proportion of administrative firms. The adapted use may host firms of supportive administrative functions, which are frequently smaller-sized and flexible, therefore suitable in adapted structures. A plausible reason for the negative relationship is that this strategy may have been adopted as a response to a low number of investments, possibly stemming from rigid protection norms of heritage structures. Indeed, opportunities hindered by a romanticized approach of maintaining uses is cited by one of the respondents when stressing the relevance of such strategy.

A similar trend is observed at the relations between the promotion of residential use and the provision of social housing within protected areas. The young stage of development of such areas may indicate that this strategy may also be a response by heritage managers that recognized the disadvantages of allowing the displacement of traditional inhabitants or simply the housing use, having an empty, decaying area as an outcome, and thus discouraging

domestic investments to locate there. In cities that are conserving heritage for a longer time, perhaps such strategies signalize the presence of strict urban regulations, which in turn may hinder the attraction of enterprises, that recognize fewer opportunities for location. The positive relationship with administrative firms may again relate to easier adaptation to strict spaces.

Surprisingly, the strategy of marketing the city under the heritage subject does not fulfill its purpose, as high scores have been negatively associated with the ratio of domestic investments. Few respondents reported using heritage for city marketing for a long time and on a consistent basis. The majority of them reported the discontinuity and the recent implementation of actions in that sense, which may explain the negative relationship. Furthermore, high scores may also indicate a response by managers to the low ratio of investments and bad performance shown by the negative relationship with nearly all other indicators, and with a negligible relationship with the share or tourism-related firms. The positive alignment with the relevance of public firms may reinforce the dominance of this sector, provoking the awareness of the need for private investments. Marketing strategy being strongly associated with regeneration may help explaining its negative correlation with construction firms.

The strategy of leveraging public investments for conservation actions is moderately, positively related to GDP per capita and weakly, also positively related to public revenue. The strong positive relationship between these two indicators allows for a joint conclusion: cities with meaningful private activities and wealth and service generations collect more taxes and are able to employ public resources on improving urban structures, and this may also apply to heritage cities. This explanation is reasonable for local public resources and also for higher shares of government, for which such economic activities also generate revenue. The negative relationship with commercial activities may relate to the fact that such sector does not generate as much public revenue as the administrative ones, and the positive share of the public sector certainly relates to higher tax revenues, allowing for a more relevant presence of such sector in a specific city's structure. It is interesting to notice that the share of construction firms is negatively correlated to public investments, reinforcing the contradiction identified previously in the regeneration strategies. Regarding the encouragement of private investments, the strong, negative relationship with domestic investments stands out. A few municipal officers reported that this strategy is in the process of being implemented or has been only recently implemented, reinforcing the conclusion that managers have been responding to low investments, and not that this is a cause of adopting such strategy.

Public participation in managing heritage and promoting broad awareness of conservation are frequently combined and, thus, positively correlated between each other and similarly related to economic indicators. The positive relationship with the share of the public sector may be explained by a probable higher interaction and access by the society, and more intense awareness activities, facilitated by a large presence of this sector. The participation may be also leveraged by a strong presence of commercial activities, whose actors frequently associate for joint actions. This apparently applies to heritage cities as well. Negative relations with economic indicators may be explained by the development stage of the structure of the economy: the larger presence of commercial activities is negatively related to all economic indicators. Furthermore, respondents provided the extra information that participation mainly happens through formal city councils, with representants of the society, public sectors and other stakeholders. The intensity of participation ranges from organizations being still in the implementation process to inconsistent participation, and to organizations with responsibility of finance-managing and deliberative decisions. In one city, civic organizations even lead public discussions about interventions in heritage areas. Raising awareness is stated by one responded to naturally happen through the perception of the economic benefits stemming from heritage conservation, mainly tourism. Officers from eight cities highlighted educational

activities in various levels as a means for spreading awareness, that are either functioning or being implemented yet.

The assessment of the challenges starts with the insufficient political commitment, that presents a relevant, negative relationship with all strategies discussed in the previous section. This implies that political will of conservation is crucial in developing governance strategies. Furthermore, the positive relationship with domestic investment may indicate that steering the political focus towards activities different than heritage conservation attracts investments. In other words, few actions and regulations for conserving heritage are perhaps related to an increased freedom of owners to develop their properties, low awareness of citizens on heritage-related matters, no heritage-based marketing, and encouragement of investments on conservation. The latter characterizes a liberal-oriented approach to economic development, however at the expense of heritage integrity. The positive relationship with construction firms may reinforce the focus on developing areas outside historical areas, more relevant to the share of such firms in cities' economy. On the other hand, tourism-related firms do not represent a relevant share of the economy when political commitment is insufficient, possibly as an outcome of an apparent neglection of heritage, which in turn does not favor the attraction of visitors and related firms. The negative relationship with the share of administrative firms may also relate to the neglection of heritage, seen as a factor of structural economic change, not being embraced as such.

Interestingly, the relevance of budgetary constraints as a problem for heritage conservation is positively related to the share of public management firms, previously assumed to be positively related to higher tax revenue. In this case, the latter is, however, negatively correlated with and may be the reason of such constraints. This may, in turn, be reinforced by a large and costly presence of the public sector, and by the lack of political commitment.

The relevance of problematic interaction with the national level is positively associated with GDP per capita and revenue ratio, however weak. A plausible explanation is supported by the strategy of leveraging public funds for investments, as its relationships with the economic indicators is similar. As such, the demand for funds from the national government by local managers may create tensions between the two spheres and frustrate the expectation of receiving financial support, as it is designated by a national entity. Strongly, positively correlated to this problem, conflicting interests between stakeholders have also similar relations of the lack of political commitment. Indeed, politicians hold a relevant stake at heritage conservation. This problem may also entails a consequent neglection of historical areas, as often important conservation actions depend upon agreements between a minimum of stakeholders.

The pressure exerted by the real estate sector is the fourth more relevant problem, however still highly scored in the survey. Its strong positive relationship with administrative firms leads to the assumption that real estate activities are being developed outside of the heritage areas, as there is a demand for supportive activities, such as administrative firms. Since the share of commercial firms is strongly, negatively related to the administrative sector, such results may be related to a change in the structural economy, however, related to contemporary developments rather than to heritage conservation. The administration and real estate firms may supply a relatively high amount of jobs, which in turn relates to higher income per capita. Therefore, the latter appear as positively related to this challenge in Table 9.

4.3 Discussion of findings

This section starts with the analysis of two aspects of relevant influence on the results of this thesis: education and structure of firms in relation to jobs, aiming at supporting the conclusions. In the end, it compares findings across the sections of the present chapter.

	Higher education (rate)
Heritage conservation	0.172***
	(0.034)
Proximity index	2.306***
	(0.118)
Income per capita	0.937***
	(0.016)
Region	yes
N	5,382
R^2	0.764

Table 10 – OLS regression results for higher education.

p-values: * p < 0.1; ** p < 0.05; *** p < 0.01.

Dummy variable's reference is non-heritage cities

yes: accounted for federation state

As human capital influences various results previously described, a regression analysis was undertaken to understand the relationship between heritage and higher education. Table 10 confirms the expectation from the literature review, that heritage cities have higher rates of high-skilled inhabitants, at the order of 17.2%, even when holding significant factors constant. This may be explained by the attractiveness role of cultural appreciation and identity solidified on the conservation of heritage structures for the creative, high-skilled labor market (Florida, 2002). This relationship can also occur in the opposite direction: cities with higher educated people tend to recognize the values of heritage and advocate for its conservation. Furthermore, such relation may also be influenced by the presence of universities in a significant number of heritage cities, or in a larger number than non-heritage ones. Nevertheless, higher education is a significant factor in the relationship between heritage conservation and economic performance. Such results imply that education mediates the relationship between heritage and GDP per capita, public revenue and FDI count and value, and moderates the one between heritage and income per capita, the rate of jobs and domestic investments. Furthermore, despite not being included in the analysis in section 4.1.3, education level is also likely to influence the shares of types of industries in each city.

	Jobs per firm	Firms (rate)	
	(1)	(1)	(2)
Heritage conservation	0.116***	0.236***	0.044
	(0.040)	(0.067)	(0.065)
Higher education (rate)	-0.014		0.402***
	(0.012)		(0.019)
GDP per capita	0.378***	0.301***	0.165***
	(0.010)	(0.016)	(0.017)
Firms (rate)	-0.237***		
	(0.008)		
Region	yes	yes	yes
N	5,533	5,533	5,533
R^2	0.389	0.523	0.556

Table 11 - OLS regression results for jobs per firm and rate of firms

p-values: ***** p < 0.1; ****** p < 0.05; ******* p < 0.01.

Dummy variable's reference is non-heritage cities

yes: accounted for federation state

Aiming at clarifying the relationship between heritage conservation, the ratio of jobs and supporting further conclusions, the analysis displayed on Table 11 assesses the mean count of jobs per firm and the count of firms in relation to cities' population. The number of jobs per firm increases by 11.6% when the city conserves a heritage ensemble and is negatively related to the ratio of firms in this city (1). One may conclude that, generally, cities have firms with specific mean jobs, and this is inversely related to the number of firms. In other words, the higher the mean jobs per firm in a city, the lower the total number of firms. In heritage cities, however, the ratio of firms is higher as well, at 23,6% (1). This implies that firms are more numerous and with a higher number of employees in these cities. The coefficient indicates that the magnitude of change is not large, therefore, it is probably related to an intermediate number of firms with intermediate labor intensity. This may confirm that heritage cities are going through structural changes in the economy, as the shares of agricultural and transformation industries, typically labor-intensive, are significantly lower in such cities, and creative-related ones are higher. The fact that the mean number of jobs per firm is not significantly related to the ratio of higher educated people may indicate a mixture of educational levels of the workers in such firms. Opposingly, the latter cancels the significance of heritage conservation to the ratio of firms and reinforces the mediating role human capital performs between heritage conservation and economic performance. The significant relationship between higher education levels and the rate of firms may also suggest that knowledge-based firms are usually more numerous than manufacturing ones in a given city.

A few management factors are worth further discussing. Marketing is adopted as one of the principal strategies in heritage cities, according to the survey results presented in figure 7. Controversially, the assessment of attracted investments shows that, among cities receiving investments, the heritage factor is negatively associated with the count and value of both domestic and foreign investments. Perhaps the recognition of heritage as an attractive component of the city is only recently recognized and embraced in strategies, or correlated factors prevent such cities to utilize the full potential of the asset. In that sense, the high, positive correlation between marketing and regeneration strategies may indicate the

acknowledgment of the necessity of integrating these actions, once regeneration is stated to help in attracting investments, however, attraction is likely to happen once improvements are publicized.

Land instruments are often highly vulnerable to the political will, and this helps to explain the low importance or the inconsistency in adopting them as strategies. Compulsory use, for instance, prevents property owners of acting aligned to their willingness, in addition to the obligation to maintaining the construction unaltered. Furthermore, the functioning of this instrument demands the initiative to be taken by the municipality, which is often discouraged by political actors.

Interaction with national level could be used as a strategy, as this level has different functions, access to different sources of finance, as well as expertise for developing strategies and supporting participatory planning processes.

Chapter 5: Conclusions and recommendations

The aim of this thesis was to assess economic effects from the conservation of heritage areas in Brazilian cities, as economic development is a major argument for neglecting such areas (Sandholz, 2017, Rama, 2012). The process of selecting the sample included the official designation aspect as a certification of the existence of a historically relevant area, in a reasonable preservation status. Therefore, the research is mainly conducted through comparing cities with designated heritage conservation areas and non-heritage cities. After introducing the main findings, this chapter will answer the sub-questions, followed by the research questions and the main research question, and recommendations for policy-making and further research.

In the first part of chapter 4, a quantitative analysis used secondary data and assessed whether heritage conservation relates to city-wide indicators, investments attractiveness and structure of the economy. The findings show heritage positively relating to GDP per capita, income per capita and the ratio of jobs, and, unexpectedly, negatively to public revenue. Furthermore, levels of human capital were found to either mediate or moderate such relations, supporting the discussion of reasons and channels through which such results are identified. Similarly, the attraction of FDI also influences such outcomes. However, both foreign and domestic investments were found to relate in a negative direction with heritage conservation. Regarding types of industry, results confirmed expectations from the literature, as mainly basic industries represent a smaller share, and creative ones, a larger share in heritage cities.

Moving forward, with the understanding from the literature that effects on the economy would depend upon governance factors, the second part assessed primary data leveraged from heritage cities' officers through an online survey. Conclusions in this regard were significantly limited by insufficient responses for a statistical analysis. However, a qualitative assessment and a correlation test indicated how has heritage been positioned in local governance, plausible relations with the first part's dependent variables, and directions for future assessments and actions. Generally, city marketing using heritage as subject is the most relevant management strategy, followed by the incorporation of protected areas within urban regulations. The encouragement of the residential use and the provision of social housing stand amongst the least prioritized actions. Furthermore, practically every strategy relates negatively with the assessed economic indicators, except for the share of firms in the commercial and public sectors. Regarding the challenges faced in governance, constraints of financial resources and conflicting interests among stakeholders appear as main problems hindering conservation. The interaction with the national level of heritage management is the least relevant one, although yet highly scored by the respondents. Their relationship with economic indicators did not reveal

a pattern or trend. Interestingly, the negative relation of domestic investments with heritage conservation is converted to positive with lack of political commitment, which may indicate efforts by political agents on attracting enterprises to non-heritage areas or reinforce the argument of the lack of understanding heritage's potential in this regard.

Sub question 1.1 (SQ1.1): How is the designated conservation of heritage areas related to overall economic indicators?

The analysis described in section 4.1.1 revealed mainly positive relationships between heritage conservation and economic performance. The description of indicators displayed in Figure 1 indicates that heritage cities perform better than non-heritage cities when mean GDP per capita, income per capita and rate of jobs are compared between the two groups of cities, and worse in public revenue.

Indeed, GDP per capita, even when controlling for external factors, is 16,8% higher in heritage cities, implying that part of the wealth produced by the dynamics of goods and services is directly or indirectly fostered by heritage-related features, sufficiently relevant to affect city-wide indicators. Similarly, the income per capita of the population living in heritage cities is approximately 20% higher than of non-heritage cities' inhabitants, even when other relevant factors are considered, which means that heritage activities improve personal gains through entrepreneurship, salaries, work opportunities. The latter, indeed, was found to have the greatest magnitude of influence among the DV by the change from the non-heritage to the heritage group, in more than 30% even holding external factors constant. This is probably an implication of the economic activities fostered by heritage, as previously mentioned, besides the identified structure of firms in heritage cities. The latter is shown, in section 4.3, to compose of an intermediate number of firms with an intermediate intensity of labor, which represents a considerable large offer of jobs. Furthermore, this variable may also act as a moderator between heritage conservation and income per capita. Analyzing such relationship in depth in heritage cities is a matter for future research.

The unforeseen result regards heritage conservation negatively related to public revenue, as previous economic effects are positive and contribute paying taxes. Plausible reasons include: local rise in property values with the conservation is insufficient to affect city-wide indicators; land made available for new developments may contribute more significantly to revenue and thus non-heritage cities have a better performance in this regard; the kind of industries developing in such cities, as industrial activities, pay higher taxes; or, as it is found in section 4.1.2 and further explain next, the fewer foreign and domestic investments attracted to such cities.

A finding of this thesis is that all economic indicators are significantly influenced by the ratio of the higher educated population, which is significantly higher in heritage cities, thus mediate and moderate such relationships. It is aligned with the cultural identity attributes of the urban environment defended by Florida (2002) to foster the rise of the creative class, mainly composed of people with a university degree and with mobile work possibilities. A relevant share of high skilled population affect the consumption of goods and services, favors the establishment and development of businesses of specific kinds, which in turn affects the performance assessed in this thesis.

A second relevant indicator that mediates and moderates the relationships between heritage and the economic indicators is FDI, which relates positively to GDP per capita and public revenue and negatively with income per capita. Nevertheless, it is negatively related to heritage conservation, which represents a downturn of designated heritage conservation in Brazilian cities. This relationship is further explained in the answer to *SQ1.2*.

Sub question 1.2 (SQ1.2): How is the designated conservation of heritage areas related to investments attractiveness?

This question is answered in two stages: first, when comparing all cities in Brazil, heritage conservation is positively related to foreign and domestic investments, as displayed in table 6. It is inferred that the fact that a given city conserves a heritage area that is nationally designated increases the probability of receiving foreign investments by 7.50% and domestic investments by 23.8%. However, this is probably stronger associated with city size and accessibility, among others factors not considered in this research. This is reinforced by the results of the second analysis: among cities that have received investments only, heritage acts as a negative factor: it lowers nearly 80% of the mean FDI count, 115% of the mean FDI value and 38.40% of the count of domestic investments. These relationships also change when considering the rate of highly educated people, which acts as a negative mediator between heritage and FDI, and as a positive moderator with domestic investments. Therefore, it is likely that the latter is directly influenced by heritage management aspects or by a different mediating variable. When assessing the correlations in Table 9 in section 4.2, the positive relation of domestic investments with the share of firms in the public sector indicates a preference for cities with a lower share of private enterprises, thus probably a larger available space for such investments. Complementarily, the lack of political commitment to heritage conservation being positively associated with domestic investments implies that managers are prioritizing areas outside of the historical ensembles and that results in attracting domestic investments. Therefore, the profile of such investments should be explored, and the location choice factor as well.

The fact that the resulting units of analysis on FDI is low must be taken into consideration: only 17 heritage cities designated before 2010 have received FDI between 2010 and 2016. While it does not prevent the plausibility and reliability of the analysis, it is important not to externalize such results to all cities in Brazil without deeper exploring factors for FDI attractiveness. References in the existing literature on FDI attractiveness factors in Brazilian cities were not found.

Sub question 1.3 (SQ1.3): What are the differences in types of industries between designated heritage and non-heritage cities?

The significant differences in types of industries found in section 4.1.3 largely relate to the change in the structure of economy aligned with highly qualified population, as suggested by Florida (2002) and discussed in section 4.3, Table 10. Significant negative shares of industry types are agriculture, transformation industry, commerce, and public administration. The former two kinds characterize primary and secondary industries, and the latter ones, tertiary industries, however characterizing underdeveloped economies. Nevertheless, a common feature among them is the demand for lower-skilled workers and relatively lower wages, when compared to technology-related industries. The latter represent a larger share of heritage cities' economy, exemplified by information and communication and scientific and technical firms. In the sector of services provision, firms with a larger share in heritage cities are related to specialized skills, such as finance and insurance, real estate, administrative, health, and social care. Economy, therefore, has developed further in heritage cities, towards higher levels of specialization and qualified workforce, largely due to higher levels of human capital. Furthermore, as indicated by literature, specific kinds of firms have an increased demand of works from heritage conservation activities. Firstly, construction industries benefit mainly from regeneration activities, consisting of refurbishing existing historical structures and urban infrastructure of heritage ensembles, and the difference is significant in heritage cities. However, findings of section 4.2, Table 9 show a negative relationship between these two factors, worth of deeper investigation. Lastly, strongly associated with cultural and touristic

features of heritage cities, firms related to accommodation, restaurants, arts, and recreation represent a larger share in such cities, confirming the exploration of the widely recognized touristic potential.
Within the types of attracted FDI, the only significant differences among all types of industries refer to positive numbers in heritage cities and align with the trend observed in the shares of firms: highly specialized services provision and tourism-related investments. Again, a greater highly-skilled ratio of the population and economic activities from historical features may influence the location choice for foreign investments.

Research question 1 (RQ1): How is the designated conservation of heritage areas related to economic performance of Brazilian cities?

There is sufficient evidence to affirm that, mainly, economic performance is positively related to the designated conservation of heritage areas. As described in detail in the previous responses, flows of goods, services, production of wealth, household income and supply of jobs positively relates to heritage conservation's effects. Opposingly, tax revenue appears to be hindered by heritage-related features, found in this thesis to relate to limited investment attractiveness and a higher share of firms that little contribute to revenue when compared to other prevalent types in other cities. For the former, unexpectedly, heritage conservation is a negative factor. Perhaps the fact the economy in Brazil is yet developing implies that main FDI relates to basic sectors yet and seek for available unskilled labor force and market for manufactured goods. Domestic investments may align to such arguments, and do not consider heritage as a location choice factor. Additionally, firms in heritage cities appear to be, on average, of intermediate size, perhaps different from what companies mainly seek for investing. The sectors to which such firms belong shows that heritage cities are fulfilling their touristic and cultural potential, and their economic structure is developed ahead of the non-heritage cities'. Such impacts by heritage are largely associated with levels of human capital, as the share of the highly-educated population is higher and contributes to characterizing the economic performance of such cities.

Research question 2 (RQ2): How are heritage governance factors related to economic performance of Brazilian cities?

The majority of the researched governance factors appeared to be either negatively related to economic indicators, or not related. A handful is positively related.
An unforeseen result regards urban regeneration, stated in the literature to favor construction activities, jobs, and attracting investments. It actually negatively relates to jobs rate, share of construction firms and negligibly relates to domestic investments.
Integrating the protected heritage area to broader urban regulations associates positively with public revenue and a larger share of public organizations, indicating a greater capacity of the public administration in developing regulations. Furthermore, it is one of the few strategies that does not relate negatively with investments, perhaps implying that it has been evolving towards achieving a win-win situation for stakeholders, as it provides the foundation for sustainable development.
The fact that the rehabilitation of heritage structures does not relate negatively with economic indicators implies that it perhaps represents a positive approach for dealing with the rigidity of protected areas and accommodate different uses, which is reinforced by the positive association with the share of administration-related firms.
Although being the most prioritized strategy among the respondents, city marketing using heritage as the subject has failed to attract investments until 2010, and the relations of regeneration strategies previously described may also stem from inadequate marketing. It has not shown a positive relationship with the touristic share of firms as well, however, the fact

that neither there is a negative relationship indicates it may actually be collaborating in that sense, in a recent stage.

Although public investments are likely to be enabled by economic performance in the first place, it relates in a positive trend with all assessed indicators, even if some relationships are yet negligible and with a later stage in the economic structure development, as commercial and construction are less relevant when this strategy is prioritized. In contrast, the encouragement of private investments appears to be hindering the attraction of new investments. As its relationship with the other economic indicators opposes the previous strategy's, potential investors perhaps do not feel encouraged to locate there, assuming that their resources will be demanded in that sense. Lastly, public participation and awareness do not relate positively to economic indicators, perhaps for being more relevant in cities with basic economic activities, as discussed in section 4.2. Additionally, such actions are only recently being developed.

Challenges are mainly positively related to economic indicators. Interestingly, the insufficiency of political commitment favours domestic investments. This may imply that focus for increasing this indicator lies on non-heritage areas, which may explain the negative performance of heritage cities in this regard. The fact that such challenge is outstandingly negatively related with all strategies reinforce the absence of focus by political actors on developing the potential of heritage areas, and touristic activities are also hindered. The only challenge negatively related to economic indicators is budgetary constraints, reinforcing the conclusion that public investments are key for stimulating the development of heritage cities.

The problematic interaction with the national level and conflicting interests between stakeholders, besides being positively related with economic indicators, demonstrate conflicts associated with leveraging public resources for intervention and unwillingness of preservation by urban actors, highly associated with lack of political commitment. Implications include the consequent neglection and decay of historical structures, as such aspects prevent such areas from developing.

Lastly, the pressure exerted by real estate developments relates to nearly all previous challenges and leads to the conclusion that related activities increase the supply of jobs and, through this channel, the income per capita. This conclusion largely relates to the development of administrative firms, probably supporting real estate activities.

Main research question: How is the designated conservation of heritage areas and its governance factors related to economic performance of Brazilian cities?

The main conclusion of this thesis is that heritage areas officially designated by IPHAN relate mainly positively with economic indicators, namely GDP per capita, income per capita and ratio of jobs. The conducted methodology does not provide foundation for a solid conclusion on the direction of causality. Nevertheless, cities were designated before the year of the assessed indicators, therefore it is plausible to infer that economic dynamics of heritage conservation have contributed to city-wide indicators. More evident is that protecting historical areas does not hinder the development of the economy, as extensively argued, therefore it is an invalid reason for destroying or abandoning historically-relevant areas. Governance factors, however, have to be conducted in favor of improving such results, as the responses revealed that strategies are mainly negatively related to economic indicators. Nevertheless, such strategies have been only recently adopted, as specified by the respondents. It is clear, therefore, that heritage areas still have a great potential to be developed. Additionally, management factors may also contribute to tackle negative outcomes from heritage conservation. Tax revenue and attractiveness of investments are highly correlated, and both negatively related with the heritage factor. Most likely, marketing strategies have not accomplished their goals, either for being recently implemented, or for inefficiency.

The ratio of jobs in heritage cities is actually stronger related with a larger share of administration firms, rather than construction and tourism. The intermediate stage these cities are in the structural change in economy helps to explain a relatively high number of firms with a reasonable number of jobs.

Among all strategies, integration to urban regulations and prioritizing leveraging public investments are exceptions in their relationships with indicators, as they positively relate with income per capita and GDP per capita. Even considering that public funds are probably enhanced by higher GDP and, thus, by higher tax collection, the fact that public investments mainly encourage individual, private investments, even to a short extent as shown in Figure 6, adds to the benefits of such strategy. As it enables revitalizing historical areas, it builds trust on public support by property owners, encourages enterprises to settle and it is likely to foster the attraction of new activities. The latter is not positively related to such strategies, however, the fact that neither there is a negative relationship relates to the fact that heritage cities that responded the survey have recently conducted public interventions and have not yielded clear results yet.

Political focus is mainly steered at attracting investments regardless of the conservation of heritage structures, thus probably prioritizing non-heritage areas. This reinforces the problem of lack of knowledge on the potential benefits heritage conservation is able to generate.

Policy making

Culture is rarely positioned a priority by Brazilian local governments. City officers are legitimately concerned about meeting basic needs of the population, such as the provision of basic infrastructure or the supply of jobs, therefore, heritage is often out of priorities. Nevertheless, heritage conservation has shown potential to improve people's life by leveraging economic development, which is yet rarely explored.

The exploration of such potential, however, demands an adequate governance. The perceived unclarity of roles and conflicting interaction among different government levels should be tackled. As argued by Santanna (2017), local governments should be assigned responsibilities of protection measures and managing conservation. However, cities should be conscious of the potential benefits heritage is able to produce before starting any conservation process, as this radically changes the outcomes. In that sense, Fonseca (2003) suggests that, prior to the definition of what should be protected, the process of identification, documentation, promotion and diffusion create a meaningful underpinning for the protected property's significance, economic value, function and social recognition. It is critical to permanently involve the population into the decision-making processes, mainly the inhabitants of historical areas, as their resistance hinder developing conservation strategies. In addition, a continuous and broad awareness strategy would encourage and sustain people's feeling of responsibility and ownership, and their willingness may support political commitment. The latter is crucial to ensure the needed prioritization of heritage (Rojas, 2016). Within the government structure in municipalities, managing heritage areas would be best suited in urban planning departments, favoring their integration into wider land use and development strategies, as these are typically tasks for this department. Support in knowledge, in capacity building and in capturing resources should be the permanent role of IPHAN, as officers in this institute are often highly qualified, are frequently in contact with officers in different cities, and are a bridge between local and national government. Furthermore, oversighting and regulating conservation are often a source of conflicts with the municipalities.

Regarding specific strategies, starting from leveraging public investments for interventions in the protected area would favor the sustainability of conservation, as it builds trust for firms and inhabitants, generally fostering individual investments in conservation. It is important to

highlight, once more, that these interventions should result from an extensive and broad, participatory decision process. Regenerating collective and individual monuments should be accompanied by rehabilitating the existing structures for current needs, which includes ensuring residential use, mainly for social purposes. Additionally, the whole process should be publicized through city marketing, aimed at building awareness of urban actors and attracting enterprises.

Land instruments have been rarely employed yet and should be further considered. Compulsory use of properties helps in avoiding structures to be abandoned and dilapidated through time, as owners are demanded to use them. Transfer of development rights compensates properties owners for underutilized construction potential, while it can encourage economic development of cities. Together with comprehensive plans, they may increase accordance and sustainability of heritage conservation.

The sense of place ensured by heritage conservation is key to sustain the attractiveness of highly educated, talented people. It is argued that ultimately businesses are attracted by human capital and not the opposite. Putting this information forward to policy recommendations, it is also important to consider that solely education will not suffice. Retaining talent is indispensable to sustain this engine (O'Brien, 2012).

Additionally, it is important to highlight that the preservation of unique cultural characters must include different groups' identities and enable various cultural manifestations (UNESCO, 2016). Cultural conservatism can prevent society from the benefits it is intended to produce, such as peace, harmony, tolerance, social inclusion, sense of belonging and, ultimately, cultural freedom (Arizpe, 2004).

Further research

Further research should, mainly, assess channels and reasons for the outcomes of this thesis. Dependent variables could be assessed into more detail, by analyzing the impact from heritage conservation on each component of such indicators. This will be especially interesting for public revenue, since data on various subcategories are available, such as property taxes, services, and industrial activities, and will indicate the focus for improving the relationship between heritage conservation and public revenue. Testing income and jobs, to understand whether the latter represent an intermediate factor, will clarify how income relates to heritage into a more detailed level.

Regarding attractiveness of investments, researching successful cases as European cities would identify transferrable actions that favoured the attraction by conserving heritage. The profile of such investments should also be explored, and the location choice factor as well. In the future, when more investments will have taken place, FDI could be tested again with a larger quantity for solid conclusions.

The important alignment of economic indicators with the rise of the creative class found in this thesis does not suffice to understand a larger share of the higher educated population in heritage cities. Assessing the existence of educational organizations, mainly universities, in such cities is necessary to draw solid conclusions on this factor.

Regarding the methodology, t-tests have simply shown differences in types of industries. Future research could aggregate controlling factors in order to isolate the effect of heritage and thus identify the magnitude of its effects, through a variance analysis. Furthermore, the assessment in this research does not prove causality. In that sense, endogeneity tests could be carried out to clarify, for instance, whether high skilled people are fundamental for supporting conservation of heritage and steer the official designation process, which ultimately attracts

more investments, or whether conserved heritage attracts investments and highly-skilled population, ultimately increasing levels of GDP and income.

Furthermore, a future quantitative analysis could assess indicators among different groups of heritage cities. For instance, splitting them by region, age and initiative of designation will potentially lead to more detailed and different results among them. The analysis of attracted investments also provides an important indication: comparing only cities that receive investments produced a completely different outcome. Probably, grouping cities according to similar economic performance will also produce different outcomes.

The Brazilian census to be conducted in 2020 by IBGE will provide a renovated base of economic indicators. Conducting the same tests by then will allow for including more heritage cities in the analysis, and also assess results from the national public investments of the program "PAC Cidades Históricas" (the program for growth acceleration of heritage cities), that happened in 2014. A longer time could also favour collecting more responses from city managers, enabling a quantitative, statistically significant analysis and yielding solid conclusions.

Deeper assessing qualitative aspects of heritage conservation would also clarify results (Rypkema, et al., 2011). For this assessment, successful management actions and positive economic performance could indicate cities to be deeper researched. A handful of cities could be selected also according to the outcomes of the research, and interviews with key actors conducted to collect data that potentially explain specific results. Congonhas and Novo Hamburgo cities have shown considerable economic performance. Furthermore, the city of Pelotas is a representative of land instruments implementation. Besides regulating the transfer of development rights, the city established specific areas of protection in the land use plan. Due to recent designation and policies implementation (2018), it will be interesting to assess indicators in the future to understand the effects of such regulations.

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Annex 1: Data management

An initial inspection of data was conducted aimed at identifying mistakes, missing values, outliers, string data and skewed distribution. Logarithm and square root transformation were adopted to satisfy the assumption of normality, in the cases of skewed distribution of data and to account for the impact from outliers.

The types of industries are defined according to CNAE (abbreviation in Portuguese for National Classification of Economic Activities) and can be seen in Table 12 (IBGE, 2013). The number of firms of each type for each city was collected under IBGE's classification and converted into percentage, in relation to total number of firms a city has. FDI data (FDI Markets, 2017) were originally classified into more categories, and were merged by the author into CNAE categories, allowing for a direct comparison between the two indicators and increasing the number of observations per group.

	Brazilian classification of types of industries
A	Agriculture, livestock, forestry, fishing and aquaculture
B	Extractive Industries
C	Transformation Industries
D	Electricity and gas
E	Water, sewage, waste management and decontamination activities
F	Construction
G	Commerce/ trade
H	Transport, storage and mail
I	Accommodation and restaurants
J	Information and communication
K	Financial, insurance and related services activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative activities and complementary services
O	Public administration, defense and social security
P	Education
Q	Human health and social services
R	Arts, culture, sport and recreation
S	Other service activities
T	Domestic services
U	International intitutions

Table 12 - Classification of types of industries by IBGE (2013)

Questionnaire

Non-responses were treated as missings in question 1 to 9, since it is not possible to assume any information. From questions 10 to 27, non-responses are replaced by 1, assuming that such strategy of challenge in either not adopted or inexistent. In case the respondent did not answer any question from the group of strategies or challenges, non-responses are treated as missing.

Questions with very few responses were disregarded in the analysis (i.e. Question 7).

Annex 2: Content of questionnaire

English questionnaire

Survey questionnaire about local management of nationally-designated heritage conservation areas

The questionnaire contributes to a final thesis of the Master programme in Urban Management and Development at IHS – Erasmus University Rotterdam. The research aims at assessing management strategies and challenges of heritage conservation and the economic performance of Brazilian heritage cities.

The provided information will be used for academic purposes and results will be shared with IPHAN. Your help is of great importance to help building empirical knowledge regarding local management of heritage cities.

Part 1. General information and characteristics

1. Name of the city: _____

2. Year of National heritage designation (if the process is not complete, please fill in with "-"): _____

3. Initiative of designation:
    a. National government
    b. Municipal government
    c. Civic initiative
    d. Other: _____

4. What is the municipal body in charge of managing the conservation area? (please select one or more options)
    a. Specific sector in the municipality
    b. It is a municipal sector, but it is not an exclusive department. It is combined with other functions
    c. Indirect administration body
    d. IPHAN's office acts in that respect
    e. There is not a specific body responsible for heritage management in the city
    f. Other: _____

5. a. Share of privately-owned properties within the heritage area: _____
    b. Share of publicly-owned properties within the heritage area: _____
    Other relevant information: _____

Part 2. Financial aspects

6. Is there a specific fund for heritage conservation?
    a. Yes
    b. No
    c. Yes, but not exclusive
    d. Other: _____

7. What share of the municipal budget is dedicated to heritage conservation? Please provide the yearly average based on budget of years 2010 to 2015 and eventually further important information:
   _____

8. Were there relevant investments for conservation in the protected area during the last 20 years? If affirmative, please provide year, source (private or public – national, regional, municipal), amount in relation to annual budget and object of the investment (restoration, infrastructure, other):
   a. No
   b. Yes
      Year: _____
      Source:
      _____
      Amount:
      _____
      Object:
      _____
      Other relevant information: _____

9. In case of existent investment in the previous question, were there civic investments in property's conservation followed or encouraged by the major investment?
   a. Yes, to a large extent
   b. Yes, to a short extent
   c. No

Part 3. Management strategies

This section aims at understanding specific strategies to manage conservation areas. It is understood that different buildings and parts of the city are probably managed in different ways. However, please try to provide the information from an overall perspective, and weight the relevance of each strategy to the city in a range from 1 to 7.

How do you rate the importance of the following strategies to manage the conservation area of your city? Please select a rate in the scale:

1 – not adopted; 2 – very irrelevant strategy; 3 – irrelevant strategy; 4 – neutral; 5 – relevant strategy; 6 – very relevant strategy; 7 – principal strategy

Furthermore, the time dimension is important for this research. For each strategy that was adopted in the city, please provide the information of year of implementation and year of end, if applicable.

10. Strategy on inner-city regeneration focusing on heritage conservation:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

11. Strategy on integrated planned conservation (conservation is included in overall policies, such as master plan or other regulations – besides 'Lei orgânica'):
    1 – 2 – 3 – 4 – 5 – 6 – 7

From year ____ to year ____
Other relevant information: _____

12. Implementation of land instruments to manage or compensate private-owned heritage properties:
    a. Compulsory use
       1 – 2 – 3 – 4 – 5 – 6 – 7
       From year ____ to year ____
       Other relevant information: _____

    b. Transfer of Development Rights
       1 – 2 – 3 – 4 – 5 – 6 – 7
       From year ____ to year ____
       Other relevant information: _____

    c. Other: _____
       1 – 2 – 3 – 4 – 5 – 6 – 7
       From year ____ to year ____
       Other relevant information: _____

13. Strategy on rehabilitation of heritage buildings:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

14. Strategy to promote residential use within the conservation area:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

15. Strategy to allocate social housing within the conservation area:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

16. Strategy for using heritage as subject for city marketing:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

17. Strategy on capturing and investing public resources for maintenance. This includes subsidies for private parties:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

18. Strategy on encouraging investments from private parties for maintenance of conservation areas:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____

Other relevant information: _____

19. Strategy aiming at increasing public participation in the decision-making and management processes related to the conservation area:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

20. Strategy to raise awareness of the broader community in relation to activities regarding the conservation area:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

21. Other strategy:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    From year ____ to year ____
    Other relevant information: _____

Part 4: Challenges

The following questions seek to understand whether specific circumstances pose a problem for managing and keeping conservation areas. Please choose the rate according to the relevance of each issue in your city, from 1 (not a problem) to 7 (major problem).

1 – not a problem; 2 – very irrelevant problem; 3 – irrelevant problem; 4 – neutral; 5 – relevant problem; 6 – very relevant problem; 7 – major problem

22. Insufficient political commitment
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Other relevant information: _____

23. Budgetary constraints
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Other relevant information: _____

24. Interaction with national-level management and policies
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Other relevant information: _____

25. Conflict of interests among stakeholders
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Other relevant information: _____

26. Development pressure
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Other relevant information: _____

27. Other problem
    1 – 2 – 3 – 4 – 5 – 6 – 7

Other relevant information: _____

Part 5: Further information

What are other relevant remarks that you would like to provide, related to the topics of the questionnaire?

_____
_____
_____
_____
_____
_____

Respondent

Name: _____

Institution: _____

If I have more questions, can I contact you?

a) Yes, via e-mail: _____ / phone number: _____
b) No

Are you interested on receiving the results of this research?

a) Yes, via e-mail: _____
b) No

Thank you!

Portuguese questionnaire

Questionário para pesquisa sobre gestão municipal de conjuntos urbanos históricos tombados a nível nacional

Este questionário contribui para uma dissertação final no âmbito do programa de mestrado em gestão e desenvolvimento urbano no IHS – Erasmus University Rotterdam

A pesquisa tem o objetivo de avaliar estratégias e desafios de conservação do patrimônio e desempenho econômico de cidades históricas brasileiras, definidas por terem um conjunto urbano tombado pelo IPHAN.

As informações concedidas serão usadas para fins acadêmicos e os resultados serão compartilhados com o IPHAN. Sua ajuda é de grande importância para incrementar o conhecimento empírico sobre a gestão municipal de cidades históricas.

Parte 1. Informações e características gerais

1. Nome da cidade: _____

2. Ano de tombamento nacional (se o processo não estiver concluído, favor preencher com "-"): _____

3. Iniciativa do pedido de tombamento:
    a. Governo federal
    b. Governo municipal
    c. Iniciativa popular
    d. Outro: _____

4. Qual é o órgão municipal responsável pela gestão do conjunto tombado? (por gentileza selecione uma ou mais opções)
    a. Há um setor específico na prefeitura
    b. Há um setor municipal, porém não é exclusivo. É combinado a outras funções
    c. Órgão da administração indireta
    d. O escritório do IPHAN se responsabiliza pela gestão
    e. Não há órgão municipal responsável pela gestão do conjunto na cidade
    f. Outro: _____

5. a. Porcentagem de imóveis protegidos de propriedade particular inseridos no conjunto tombado:_____
    b. Porcentagem de imóveis protegidos de propriedade pública inseridos no conjunto tombado:_____
    Outras informações relevantes:
    _____

Part 2. Aspectos financeiros

6. Existe um fundo específico para a conservação do conjunto histórico?

a. Sim
b. Não
c. Sim, mas misto a outras funções
d. Outro: _____

7. Qual a proporção do orçamento municipal dedicada à conservação do conjunto histórico? Por gentileza, informar a média anual baseada nos orçamentos dos anos 2010 a 2015 e eventuais informações complementares:
_____
_____

8. Houve investimentos importantes para conservação do conjunto histórico nos últimos 20 anos? Se sim, por gentileza, informar ano, fonte (privada ou pública e nacional, estadual ou municipal), montante em relação ao orçamento municipal do ano e objeto do investimento (restauração, infraestrutura, outros):
   a. Não
   b. Sim
      Ano: _____
      Fonte:
      _____
      Montante:
      _____
      Objeto:
      _____
      Outras informações relevantes:
      _____

9. Em caso afirmativo na questão anterior, houve significativo aumento em investimentos particulares na conservação de propriedades estimulados pelo investimento mencionado?
   a. Sim, em grande medida
   b. Sim, em certa medida
   c. Não

Parte 3. Estratégias de gestão

Esta seção tem a intenção de captar informações sobre estratégias adotadas para gerir os conjuntos históricos. Apesar de diferentes construções e áreas serem provavelmente geridos de formas distintas, por gentileza, adote uma perspectiva geral sobre importância e priorização de cada uma das formas.

Como você avalia a relevância de cada uma das seguintes estratégias para gerir a conservação do conjunto histórico tombado? Por gentileza, selecione um valor na escala:

1 – estratégia não adotada; 2 – estratégia muito irrelevante; 3 – estratégia irrelevante; 4 – neutro; 5 – estratégia relevante; 6 – estratégia muito relevante; 7 – estratégia principal

Além disso, a dimensão do tempo é importante para esta pesquisa. Para cada uma das estratégias que foram empregadas na cidade, por favor informe ano de implementação e ano de encerramento, quando aplicável.

10. Regeneração do centro urbano baseada na conservação do patrimônio:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

11. Conservação do conjunto histórico integrada ao planejamento urbano (a conservação está incluída em políticas de planejamento, como Plano Diretor ou outras regulamentações, exceto Lei Orgânica):
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

12. Implementação de instrumentos urbanísticos para gerir e/ou compensar propriedades históricas privadas:
    a. Utilização compulsória do imóvel
       1 – 2 – 3 – 4 – 5 – 6 – 7
       Do ano ____ ao ano ____
       Outras informações importantes: _____

    b. Transferência do direito de construir
       1 – 2 – 3 – 4 – 5 – 6 – 7
       Do ano ____ ao ano ____
       Outras informações importantes: _____

    c. Outro: _____
       1 – 2 – 3 – 4 – 5 – 6 – 7
       Do ano ____ ao ano ____
       Outras informações importantes: _____

13. Reabilitação de prédios históricos:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

14. Promoção do uso residencial dentro do conjunto histórico:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

15. Inclusão de habitação social dentro do conjunto histórico:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

16. Adoção do patrimônio histórico como tema de marketing da cidade:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

17. Captação e investimento de recursos públicos para manutenção do conjunto protegido. Inclui subsídios para propriedades particulares:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

18. Estímulo ao investimento de partes interessadas privadas para manutenção do conjunto histórico:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

19. Encorajamento da participação popular nos processos de decisão e gestão relativos ao conjunto histórico:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

20. Estratégias para aumentar a conscientização da ampla comunidade em relação a ações tomadas para a conservação do conjunto histórico:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

21. Outra estratégia:
    1 – 2 – 3 – 4 – 5 – 6 – 7
    Do ano ____ ao ano ____
    Outras informações importantes:
    _____

Parte 4: Desafios

As questões a seguir objetivam obter a informação se circunstâncias específicas representam problemas para a conservação e manutenção do conjunto tombado. Por favor, selecione um valor de acordo com a relevância de cada questão em sua cidade, de 1 (não é um problema) a 7 (problema principal):

1 – não é um problema; 2 – problema muito irrelevante; 3 – problema irrelevante; 4 – neutro; 5 – problema relevante; 6 – problema muito relevante; 7 – problema principal

22. Comprometimento politico insuficiente

1 – 2 – 3 – 4 – 5 – 6 – 7
Outras informações importantes:
_____

23. Limitações orçamentárias
1 – 2 – 3 – 4 – 5 – 6 – 7
Outras informações importantes:
_____

24. Interação com gestão e políticas da esfera federal
1 – 2 – 3 – 4 – 5 – 6 – 7
Outras informações importantes:
_____

25. Conflito de interesses entre partes interessadas
1 – 2 – 3 – 4 – 5 – 6 – 7
Outras informações importantes:
_____

26. Pressão exercida pelo desenvolvimento imobiliário
1 – 2 – 3 – 4 – 5 – 6 – 7
Outras informações importantes:
_____

27. Outro problema
1 – 2 – 3 – 4 – 5 – 6 – 7
Outras informações importantes:
_____

Parte 5: Informações complementares

Quais outras observações e informações importantes você poderia providenciar em relação aos tópicos abordados no questionário?

_____
_____
_____
_____
_____
_____

Informações do respondente:

Nome: _____

Instituição: _____

Se houver mais questões, posso contatá-lo?

c) Sim, contato: _____
d) Não

Tem interesse em receber os resultados da pesquisa?

a) Sim, contato: _____
b) Não

Muito obrigada!

Annex 3: Description of variables of *RQ1*

Annex 3.1: Variables of SQ1.1

	N	Mean	Std. Dev.	Min	Max
Independent variable					
Designated heritage conservation	5,530	0.012	0.112	0	1
Dependent variables					
GDP per capita (x1,000)	5,565	1,260.24	1,472.06	225.64	31,222.07
Income per capita	5,565	493.605	243.269	96.25	2,043.74
Public revenue (rate)	5,466	1,665.79	1,094.82	19.782	14,295.75
Jobs (rate) (x10,000)	5,561	2,058.12	15,753.62	8.130	913,917.8
Control variables					
Federation state	5,570	32.377	9.833	11	53
Proximity index	5,386	0.323	0.040	0.214	0.563
Coastal	5,570	0.066	0.248	0	1
Domestic investment (rate) (x100,000)	4,365	144.08	131.54	5.328	3,786.16
FDI count (rate) (x1,000,000)	159	33.687	46.458	1.551	344.80
Higher education (rate) (x1,000)	5,565	41.743	26.143	1.817	266.88

	GDP per capita	**Income per capita**	**Public revenue (rate)**	**Jobs (rate)**	Designated heritage	Federation state	Proximity index	Coastal (dummy)	Domestic investment (rate)	FDI count (rate)	Higher education (rate)
GDP per capita	1										
Income per capita	0.453	1									
Public revenue (rate)	0.868	0.284	1								
Jobs (rate)	0.714	0.761	0.563	1							
Designated heritage conservation	-0.086	0.197	-0.068	0.140	1						
Federation state	0.330	0.465	0.259	0.311	-0.058	1					
Proximity index	-0.022	0.511	-0.182	0.259	0.257	0.132	1				
Coastal city	0.069	0.015	0.131	0.100	0.343	-0.146	0.017	1			
Domestic investment (rate)	0.639	0.566	0.602	0.657	-0.112	0.549	0.083	0.091	1		
FDI count (rate)	0.331	-0.169	0.474	0.055	-0.262	0.130	-0.460	-0.148	0.267	1	
Higher education (rate)	0.297	0.899	0.123	0.590	0.235	0.335	0.644	-0.003	0.398	-0.277	1

obs = 146

Legend

- very strong positive relationship (r=+.70 or higher)
- strong positive relationship (r=+.40 to +.69)
- moderate positive relationship (r=+.30 to +.39)
- weak positive relationship (r=+.20 to +.29)
- no or negligible relationship (r=+.01 to -.19)
- weak negative relationship (r=-.20 to -.29)
- moderate negative relationship (r=-.30 to -.39)
- strong negative relationship (r=-.40 to -.69)
- very strong negative relationship (r=-.70 or higher)

Annex 3.2: Description of variables of SQ1.2

	N	Mean	Std. Dev.	Min	Max
Independent variable					
Designated heritage conservation	5,530	0.012	0.112	0	1
Dependent variables					
FDI after 2010	5,570	0.026	0.161	0	1
Domestic investment	5,570	0.783	0.411	0	1
FDI count (rate) (x1,000,000)	149	35.177	61.507	1.227	478.92
FDI value (rate)	149	2,894.14	7,113.82	2.045	61,252.56
Domestic investment (rate) (x100,000)	4,365	144.08	131.54	5.328	3,786.16
Control variables					
Federation state	5,570	32.377	9.833	11	53
Population	5,570	34,253.51	202,907.40	805	11,244,370
GDP (x10,000)	5,570	69,776.47	739,320.40	721.776	45,049,200
Proximity index	5,386	0.323	0.040	0.214	0.563
Higher education	5,565	2,419.36	27,395.24	11	1,572,070
GDP per capita	5,565	12,602.48	14,720.65	2,256.42	312,220.7
Higher education (rate) (x1,000)	5,565	41.743	26.143	1.817	266.88

	FDI count (rate)	**FDI value (rate)**	**Domestic investment (rate)**	Designated heritage	Federation state	GDP per capita	Higher education (rate)
FDI count (rate)	1						
FDI value (rate)	0.720	1					
Domestic investment (rate)	0.378	0.082	1				
Designated heritage conservation	-0.157	-0.084	-0.114	1			
Federation state	0.223	0.045	0.495	-0.032	1		
GDP per capita	0.422	0.233	0.419	-0.058	0.271	1	
Higher education (rate)	-0.228	-0.257	0.207	0.179	0.250	0.159	1

obs = 134

Legend

- very strong positive relationship (r=+.70 or higher)
- strong positive relationship (r=+.40 to +.69)
- moderate positive relationship (r=+.30 to +.39)
- weak positive relationship (r=+.20 to +.29)
- no or negligible relationship (r=+.01 to -.19)
- weak negative relationship (r=-.20 to -.29)
- moderate negative relationship (r=-.30 to -.39)
- strong negative relationship (r=-.40 to -.69)
- very strong negative relationship (r=-.70 or higher)

Annex 3.3: Description of variables of SQ1.3

	N	Mean	Std. Dev.	Min	Max
Independent variable					
Designated heritage conservation	5,530	0.012	0.112	0	1
Dependent variables					
Share of firms by sector					
A - Agriculture	5,565	3.479	8.817	0	86.04
B - Extractive industry	5,565	0.515	1.459	0	31.85
C - Transformation industry	5,565	7.927	6.540	0	54.23
D - Electricity	5,565	0.042	0.361	0	16
E - Sanitation services	5,565	0.197	0.455	0	8.11
F - Construction	5,565	2.099	2.005	0	20
G - Commerce	5,565	49.445	12.281	4.95	86.39
H - Transportation and storage	5,565	3.955	4.248	0	50.64
I - Accommodation and restaurants	5,565	4.981	4.183	0	50.80
J - Information and communication	5,565	0.879	1.820	0	65.78
K - Finance and insurance	5,565	0.355	0.736	0	17.18
L - Real estate	5,565	0.209	0.452	0	7.53
M - Scientific and technical	5,565	1.941	1.856	0	48.52
N - Administration and related services	5,565	2.631	2.622	0	32.82
O - Public administration	5,565	2.223	2.936	.01	45.65
P - Education	5,565	3.176	3.959	0	52.94
Q - Health and social care	5,565	1.469	1.449	0	15.38
R - Arts, culture and recreation	5,565	1.023	1.386	0	31.58
S - Other services	5,565	13.443	10.765	0	82
U - International organizations	5,565	0.0005	0.011	0	0.49
Count of FDI by sector					
B - Extractive industry	147	0.346	0.368	0	23
C - Transformation industry	147	3.061	5.318	0	34
D - Electricity	147	0.047	0.213	0	1
F - Construction	147	0.040	0.198	0	1
H - Transportation and storage	147	0.312	0.729	0	5
I - Accommodation and restaurants	147	0.054	0.326	0	3
J - Information and communication	147	0.802	2.036	0	13
K - Finance and insurance	147	0.163	0.468	0	3
L - Real estate	147	0.047	0.213	0	1
N - Administration and related services	147	0.306	0.983	0	7
Q - Health and social care	147	0	0	0	0
R - Arts, culture and recreation	147	0	0	0	0
U - International organizations	147	0.136	0.746	0	8

Annex 4: Summary of the survey responses – RQ2

	N	Mean	Std. Dev.	Min	Max
Year of designation	31	1992	23.247	1938	2018
Population	31	632,008	1,276,150	1,717	6,323,037
Q3 Designation initiative	31	2.096	1.220	1	4
Q4 Accountable management body	29	3.41	1.880	1	6
Q5 Share of private properties	23	84.677	13.188	50	99
Q5 Share of public properties	25	22.096	26.630	1	100
Q6 Fund for conservation	27	1.925	0.729	1	4
Q7 Expenditure	6	0.065	0.075	0.001	0.200
Q8 Investments (x1,000)	12	133,869.1	430,424	100	1,500,000
Q9 Encouraged private investments	24	2.333	0.564	1	3
Strategies					
Q10 Urban regeneration	24	3.791	2.105	1	7
Q11 Integration to urban regulations	24	4.167	2.119	1	7
Q12a Compulsory use	24	2.125	1.801	1	7
Q12b Transfer of development rights	24	2.375	1.951	1	7
Q13 Rehabilitation/ adaptive reuse	24	3.916	1.998	1	7
Q14 Promotion of housing use	24	2.875	1.962	1	6
Q15 Social housing	24	1.750	1.359	1	5
Q16 City marketing	24	4.375	2.203	1	7
Q17 Public investments	24	3.458	2.302	1	7
Q18 Encouragement of private investment	24	3.125	2.173	1	7
Q19 Public participation	24	3.916	1.767	1	6
Q20 Broad awareness	24	4	2.105	1	7
Challenges					
Q22 Insufficient political commitment	25	5.120	1.921	1	7
Q23 Budget constraints	25	5.800	1.154	3	7
Q24 Interaction with national realm	25	4.160	1.929	1	7
Q25 Clashing interests between stakeholders	25	5.080	1.605	1	7
Q26 Pressure from real estate	25	4.680	1.700	1	7

Obs: A few questions are not included since they have insufficient responses for consideration.

Annex 5: IHS copyright form

In order to allow the IHS Research Committee to select and publish the best UMD theses, participants need to sign and hand in this copy right form to the course bureau together with their final thesis.

Criteria for publishing:

A summary of 300 to 500 words should be included in the thesis.

The number of pages for the thesis is about 60.

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