

# Economics of iconic architecture

**A LITERATURE STUDY ON SPILLOVER EFFECTS OF ICONIC ARCHITECTURE  
ON REAL ESTATE PRICES IN URBAN AREAS**

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# EXECUTIVE SUMMARY

This paper discusses the impact of iconic architecture on real estate prices in urban areas from the perspective of welfare economics. First, the definition of iconic architecture will be discussed. Where researches on iconic architecture often use an arbitrary binary classification (a building is either iconic or not), this will be discussed and a possible solution (continuum approach) will be presented.

Successively, the phenomenon of spillover effects is discussed. Where classic welfare economists defend a certain level of interventionism of governments in order to reach the optimal situation for the public, increasingly more criticism has emerged. Research shows that government interventionism does not necessarily lead to Pareto improvements and should always be debated.

However, in some areas governments do not only have a possible function of interventionists. For example, urban development is one of the responsibilities and aims of municipalities and therefore municipalities play a double role (not only the 'intervening' role (Pigou's argument), but also an internal negotiating role (critics' argument).

After that, the welfare economical view on spillover effects will be applied to iconic architecture. It finds that real estate investors typically strive to reach a private optimum and do not take the external effects of the building design quality on the neighbourhood into account. Therefore, a risk of underinvestment into the external appearance of buildings is present, in market equilibrium. Whether public interventions are justified essentially depends on whether the externalities are significantly present.

This paper summarizes researches on the spillover effects of architecture on real estate prices, distinguishing between residential and office areas by using four factors and three spillover ranges: immediate neighbourhoods (with views on the architecture), districts and cities. The four factors determining user utility (hence rents) are ease of face-to-face activities (related to proximity), quality of buildings (objective properties), quality of address (aesthetics and prestige) and metropolitan access (accessability).

Finally, this paper uses the amenity theory to explain *how* the presence of iconic architecture results in urban development and how cities and project developers benefit from creating such architecture. The process of gentrification, which is the revival of districts through the presence of the creative class, and the role of human capital in urban development are explained.

The paper concludes with suggestions for further (empirical) research.

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# 1 INTRODUCTION

## 1.1 Background and motive

*“The ‘Kop van Zuid’ area in Rotterdam has been nominated by the Harvard Design School for the Veronica Rudge Green Prize. The Veronica Rudge Green Prize in Urban Design is the foremost award recognizing achievement in this field. The Prize is awarded every two years to recognize excellence in urban design with an emphasis on projects that contribute to the public realm of a city and improve the quality of urban life”.*

- Newsbulletin March 5, 2013 (ClickNL, 2013)

Overwhelming architecture emerges in the ‘Kop van Zuid’ area in Rotterdam. Over the last 20 years, architects have been granted access by the municipality to effectuate various high buildings and iconic architecture. Prizes have been won and even more impressive buildings are planned to be realized over the coming years;

The realization of three expensive bridges designed by the famous Spanish architect Calatrava in Haarlemmermeer;

Investments of the municipality Heerlen in the city’s popscene and architecture, like the Glaspaleis; Amsterdam requiring participation of project developers in the northern part of Amsterdam in a public investment near the river ‘de IJ’;

Major public investments in cultural heritage like monuments and sites by organizations like UNESCO; High ascending debates in cities like Den Haag (regarding the possible realization of the Spuiforum theatre) and Rotterdam (regarding the possible realization of the Kuip sports stadium);

These are all examples of current debates and events that policy makers, politicians, urban planners, project developers and real estate investors puzzle over as we speak. In such discussions, iconic architecture is presumed to have a positive impact on the cities. Those involved bring up several functions of iconic architecture, varying from symbolic and ‘postcard’ value, certain sacredness, prestige and identity forming and catalytic function or ‘urban boosterism’.

Empirical evidence for one authority being able to single-handedly bring on urban success is, if present at all, in dribs and drabs. Spillover effects of iconic architecture has been increasingly the topic of economic studies and is of utmost relevance if earlier mentioned debates should be based on economic data, calculations and estimations instead of just smooth talk and assumptions.

Iconic projects come with high expenditure and quite often these are partly publicly funded. The debate whether public money is correctly used is therefore relevant, requiring economic support for the realization of iconic architecture. Too often expensive projects fail, and do not result in the desired effects, resulting in significant financial losses.

## 1.2 Problem statement

Given that iconic architecture goes beyond mere functionality, this is worthy of being defined, as significant amounts of costs are being made contributing to this 'something greater', even though the, economy-wise, challenging times seem to continuously call for economization of unnecessary costs.

This paper will investigate economic theory on the impact of iconic architecture on surrounding real estate prices and find out if a certain premium for external effects can be recognized. Ultimately, it will attempt to answer the following main research question:

*What economic theories describe the impact of iconic architecture on the value of real estate in urban areas?*

To get an answer to this question, certain sub research questions must be answered. First, the concept of iconic architecture will be discussed. Who determines whether or not a building is iconic or not, does "iconic architecture" exist at all and how can or should economists relate to such a concept that can be quite vague and ambivalent. The first question therefore is:

*What does the term iconic architecture mean to economists?*

After defining iconic architecture, economic theory on impact will be presented. The term that is used in welfare economics for impact of activities (production/consumption) is externalities or spillover effects. How are spillover effects recognized and measured? What are possible solutions that economic theory proposes to fix corresponding problems? The question central in this chapter will be:

*What does economic theory say about recognition and measurement of spillover effects and impact of activities?*

Where this chapter will present some insights of spillover effects to the architectural field of work, the next chapter will continue this by linking the concept of iconic architecture to spillover effects, investigating how spillover effects are present. It will distinguish between the effects of iconic architecture on residential and office areas, when trying to answer:

*What spillover effects flow from iconic architecture in urban areas and how can these be measured?*

Finally, the yield of iconic architecture for cities and project developers is sought. Do cities ultimately benefit from iconic architecture and how can this relationship be explained?

*How do cities and project developers benefit from the presence of iconic architecture?*

## 1.3 Methods

For this paper I have chosen to do two things: summarize empirically validated findings from other studies that are relevant to the questions of this research and add my own line of thought that is not empirically validated.

Most of the research is based on the revealed Willingness-to-Pay (WTP) axiom of agents. It assumes that agents are rational in answering questionnaires and that preferences are indeed correctly represented by choices. There of course is a lot of dispute on the validity of this assumption, stating that the rational choice theory (RCT) does not always hold, but without taking rationality as given, this paper will not be able to draw any conclusions. And as Mill once proposed (1843), when disturbing or intervening factors are present that prevent economic tendencies to happen, the model is not entirely useless per se. The physics model, or composition of causes, describes that directions of vector powers in models may still be the same and cause at least a certain direction of effect.

Therefore in this paper I will accept the assumption of RCT, so that WTP can be used to understand what is going on.

I have tried to not only discuss the theory that is purely necessary for answering the research question, but also provide background theory that will help understanding the relevance of the research. The paper will start off with a general introduction to the economic area of urban development. In chapter 3, welfare economic theory will be used, discussing views from Pigou, Robbins, Rothbard and Block. Chapter 4 will mainly consist of several different empirical studies that make use of the hedonic pricing method and chapter 5 will use the amenity theory and Glaeser's, Florida's and Marlet's work on defining the benefits of iconic architecture for cities.

I hope my research will contribute to science and create a bridge from science to practical application through local governments and municipalities.

#### **1.4 List of chapters**

The layout of this paper is very simple, all sub questions have their own chapter. Chapter 2 will discuss the first sub question and is titled 'defining the iconic'. Chapter 3 will discuss the second sub question and is titled 'recognizing impact'. Chapter 4 will discuss the third sub question and is titled 'spillover effects iconic architecture'. Chapter 5 will discuss the last sub question and is called 'yields of iconic architecture'. Chapter 6 will conclude, discuss the limitations of this research and make suggestions for further research and chapter 7 is an overview of used literature in this paper.

## 2. DEFINING THE ICONIC

Intuitively, the concept iconic architecture brings up images of buildings like the pyramids in Egypt, the Amphitheatrum Flavium (or Colosseum) in Rome, the opera house in Sydney, the Burj Khalifa in Dubai and the Guggenheim museum in Bilbao. In this exploring research the definition of iconic architecture is crucial. Does iconic architecture exist, when approached through economic theory? Are economists allowed to use an 'iconic attribute' in a binary, true or false, manner and if so, what are the underlying determinants, assumptions and criteria that have to be met and ascertained? Or is this approach simply bullocks and is an ordinal scale the best economists can validly come up with. In this chapter I hope to propose a discussion on how economic researchers in particular should cope with the definition iconic architecture.

In an attempt to denote the essence of iconic architectures, several possible approaches can be used. The most logical way is to start with the generally accepted definition of an icon and applying this to architectural context. Where the Oxford dictionary defines an icon as a representative symbol of a cultural period, a first criterion of recognizing something as iconic is that it has to sustain representativeness of a cultural period. Where this definition is sufficient for labelling the Egyptian pyramids and the Roman Colosseum as iconic, it cannot suffice in doing so for modern architecture. Because how should economists recognize representativeness in the midst of a cultural period? Instead of helping economists with a workable definition, this would levy a burden of understanding and denoting cultural periods and their possible representative symbols unto them. Such debates belong to cultural sciences.

Alternatively, some basic criteria could be made up as borders of a sandbox, defining what buildings fall inside the box (resulting in iconic status) and what does not. The following criteria are defensible, but also very arbitrary and disputable. Iconic architecture for example has to be (functionally) different from other architecture, standing out in its context. Iconic architecture have to carry a certain symbolic value, based on and in line with its location. Iconic architecture has to be aesthetically appealing – the design should be outstanding. These three (form, functionality and location) are indeed used by researchers (for example Ahlfeldt & Maennig, 2009), but are questionable. Aesthetics for example, depend on taste. Symbolic value is arbitrary. And would moving the Burj Khalifa really matter that much?

A popular definition is one used by London School of Economics professor Sklair (2010): "Iconicity in architecture is defined in terms of fame and special symbolic/aesthetic significance as applied to buildings, spaces and in some cases architects themselves". This partly overlaps with the previous mentioned way of defining the iconic and therefore still is arbitrary. Fame could probably be measured and ranked through extensive questionnaires among the public and symbolic/aesthetic significance could be determined by a panel of professionals. But still, this is not waterproof.

These approaches assume that iconic status is a binary attribute that buildings can be accredited with. A building is either iconic, or it is not. Such approach is understandable, as empirical researches require

clarity and distinguishable variables for statistical use. Pragmatism sometimes is inevitable in operationalizing definitions or concepts and often is even very useful, but should not be easily assumed as fully validated and therefore always questioned. Patterson (2012) chose the pragmatic way of using all buildings of winners of the Pritzker (seen as the Nobel prize of architecture) as iconic buildings.

One could instead also argue for a continuum of iconicity. For this, a regression should be deployed, including many independent variables that are purely objective but not excluding the more subjective parts. Objective variables could be size, age, proximity, costs, height, use (vacancy), private value etc. Although the effect of variables of this vector approach have been used in research and will also be discussed later in this paper, this iconicity scale does not exist. And with a reason: in order to estimate the coefficients of variables within such regression, the essence of iconic status should be clear. If building A scores 1000 on this iconicity scale and building B only 800, what does that say? How is this calculated? Correlation coefficients can only be estimated after empiric research on a certain effect. This effect is just not defined and, since Y is not defined, the coefficients do not exist.

A second counterargument to this approach is that coefficients may differ over various categories. This is in line with recognizing that iconic architecture comes in different sorts. It makes sense to review monuments on different variables than office buildings or residential areas. A solution would be that different categories of architecture have their own regression and continuum of iconicity. Within these categories, a certain threshold may then be set. UNESCO for example, uses the criterion that an outstanding universal value from the point of history, art or science should be present when weighing monuments and groups of buildings and outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view should be present for sites (UNESCO, 1972).

Concluding that there is no identified, waterproof crux of iconicity, this paper fortunately does not necessarily need one. The aim of this paper is to show the effects of iconicity of architecture on surrounding real estate prices in urban areas. This will present a vector tendency and due to the absence of empirics within this research, vectors are enough. I will therefor hang on to the definition of Sklar in the proceedings of this paper, mentioned a few paragraphs before.

As the result of a thought experiment, I even dare to propose the possibility of inverting the reasoning of this research. I dare to plead for a new definition of iconic architecture, namely that iconicity can be determined (using the continuum approach) using data on external impact. Such data is collectible as I will show later in this research. Of course, the source of iconicity will remain the same (things like location, historical value, objective variables and symbolic/aesthetic significance) but, as I later will argue, these sources will be processed into external effects that in turn can be used as a proxy for iconicity.

But, as mentioned: the aim of this paper is to theoretically show the impact of iconic architecture on surrounding real estate and possible consequences of this impact using a definition of iconicity and not vice versa, so I will now proceed with doing so.



### 3. RECOGNIZING IMPACT

In classic interventionist welfare economics, starting with the British economist Arthur Cecil Pigou in the beginning of the twentieth century, externalities are present when some of the costs or benefits of activities “spill over” to other parties that did not choose for these. When it is a cost that is imposed on third parties, it is called a negative externality and when a benefit flows from the activity it is called a positive externality. Given the assumption that economic agents behave rationally, they try to optimize their private welfare equilibrium, i.e. the state in which they cannot get better off.

The aggregate of private welfare states in a society is called social welfare. Like private welfare, social welfare has an optimum. However, this optimum is not likely to be achieved when a ‘laissez-faire’ approach is active in the market. In other words: non-intervened markets do not reach society’s best. Hence Pigou stated that governments should prohibit or levy taxes on activities with negative spillover effects, so that the corresponding overconsumption (or overproduction) in a non-intervened market gets corrected and the private and social equilibrium state once again align. Activities with positive external impact should vice versa be subsidized or required. Pigou goes even further in stating that all products that yield positive externalities are public goods and should therefore be produced collectively, as welfare detrimental free-rider effects would otherwise be present.

Pigou’s theory consists out of two parts: describing the phenomenon of external effects and a possible way of correcting for this, which is his vision on how a social optimum could be reached. Both can be criticized, with relevance for this theory study.

To start with the first part, critics of Pigou’s theory (validly) claim that almost every asset has externalities. Block (1983) states that even socks have spillover effects: if I decide not to wear any and everyone else does, I benefit from not smelling sweaty feet all day while I am not paying for this benefit. In a way, Pigou was right, but trying to distinguish between goods with and without externalities seems irrelevant. The attention should instead be on what these effects require, if at all, from policy makers. Given that externalities are present, how should policy makers respond? This question kicks off the criticism on the second part of Pigou’s theory.

Chapter 5 will connect spillover effects to architecture more extensively, but for now I want to present a few examples that neatly describe what the real discussion should be.

First, imagine that my neighbour appreciates it if I keep my house well-painted and my garden neat, describing a situation where benefits from my action flow over to my neighbour. More specifically, my neighbour is very rich and picky and always hires painters and gardeners to keep things nice. Since his preferences are in this, if I would behave correspondingly, it would yield maximum externalities to him since I provide up until the point that he no longer values over the accompanying costs. However, I am a student and have learned to hold a brush only two years ago and do not necessarily gain utility from having a very neat exterior. I therefore do it myself, up until the point where my cost/benefit ratio is in

balance, my private equilibrium. Pigou would recommend the local authority to give me some money so that I can hire a professional painter, resulting in an increase of social welfare. He could also recommend that professionally painted houses are now legally required or that municipalities should hire a team of painters to brighten up all the houses. Anyhow: through intervention, a higher level of social welfare is supposed to be reached.

Robbins (1932) challenges this by making use of the criterion of Pareto optimality as the basis of welfare economics. Pareto optimality is a state in which no Pareto improvements can be made, meaning that no individual can be made better off without making others worse off. If a change in policy does not impose Pareto improvements, economists cannot unambiguously agree that the new state indeed is better. Rothbard (1956) went even further by pointing out that preferences are revealed in choices and that these decisions should therefore be measured. In the case of my house: if my neighbour does not hire a painter for me, he apparently does not value my exterior that much. Coase (1960) theorized that intervention is not required when transaction costs are low and property rights are clearly defined, the involved private agents will always work out the best solution, that is often far more creative and yielding than imposed regulations. Also, since utility of different agents cannot be compared as preferences inherently are ordinal instead of cardinal (under the assumption of certainty that is most likely in 1-to-1 situations), trade-offs cannot be made by a third, external party.

This still leaves room for debate on what goods still do call for public intervention. Where it indeed seems nonsense that public sector is required to reach the optimal solution between me and my neighbour, without being unnecessarily deprived from my personal liberty, there are situations in which local governments have their own agenda that private agents do not seek.

At this point it might be useful to place this paper in a larger context. The basic (deep) underlying principle proving the relevance of researching external effects of iconic architecture is that in principle, all economic entities are looking for sustaining or increasing a level of growth. Cities do as well, and we usually call this urban development. Urban development is a relatively new area of economic specialism, focusing on the growth of urban areas by trying to explain, predict and control this growth. Where transportation costs of goods used to be the main drive of people to agglomerate (Weber has done much research on this in the beginning of the twentieth century), this is no longer the single reason. The question why people still want to live in cities is therefore a relevant question that has been alluring economists to research.

Urban development typically is influenced by a large set of external effects of activities within urban areas. As earlier explained, almost all activities within urban areas yield external effects of which some affect the urban development. The relationship between economic growth and iconic architecture will be discussed in chapter 5. For now it suffices to state urban development requires relative-to-other-cities attractiveness, that activities within the city affect this attractiveness through the external effects they cause and that municipalities are therefore not only publicly but also 'privately', or as agent involved in the activities of a city.

Public actions in cities should therefore not always be considered as interventions, as they can also be 1-on-1 agreements such as the one my neighbour and I can make. This is a crucial point when the role of local governments is questioned later in this paper.

To clarify this I want to take the example of the theatre of Rotterdam. The municipality believed that, in line with Pigou's theory, it was responsible for creating a theatre in the city centre of Rotterdam. The theatre was expected to yield positive externalities (cultural, educational) and was therefore labelled to be a public good that should be collectively funded. The theatre was created in accordance to this classic theory, with an intervening role of the municipality. But, again crucial, the municipality found out that it did not only have an 'intervening' role (Pigou's argument), but also a negotiating role (critics' argument). There were aspects in the realization of the theatre that did yield external effects but intuitively were not socially optimized, such as the design. The building received the mocking nickname 'De Kist van Quist' (box of Quist) after the architect, describing that the theatre was not indisputably the next Sydney Opera House. The municipality understood that not all external effects were accounted for and although these decisions and observations were guesswork, the underproduction of aesthetic value played a role in the choice of the city council to approve of the most expensive and prestigious proposal of the Erasmusbridge some years later.

## 4. SPILLOVER EFFECTS ICONIC ARCHITECTURE

In the second chapter I have dwelled on possible ways of defining iconic architecture. As stated, this research perceives architecture to be iconic when a certain fame is connected to buildings or sites which is caused through the presence of symbolic, aesthetic or functional aspects. The third chapter elaborates on the concept of spillover effects and the relevance of understanding these for increasing the collective level of welfare of a society. It also states that local governments sometimes play multiple roles in creating certain things that are both in their own interest and part of their responsibilities. A perfect example of this is competitive advantage over other cities, so that urban areas develop economically. Chapter 5 will describe the advantages of creating iconic architecture that cities and developers gain, but first, in this chapter I will link the theory of spillover effects to iconic architecture.

To do this, I need a way of expressing spillover effects. In this paper I have chosen to use real estate prices. In accordance with the Rational Choice Theory, real estate prices denote the values. The relative increase of real estate prices are therefore often used as a performance index of a city with respect to others. Not only real estate prices can do this, GDP per capita is also an instrument that can measure economic growth performances among cities. Real estate prices are a leading indicator of GDP growth. Chui & Chau (2005) shows that this has major implications. He states that local policy makers should try to increase real estate prices, in particular of the residential sector. He states that any policy that stimulates real estate prices will also stimulate the economy.

Campbell & Cocco (2007) also support this in their research on the relationship between house prices and consumption, claiming that there even is some causality between house prices and GDP growth. They state that rising house prices increase perceived wealth of household and relaxation of borrowing constraints. Higher house prices lead consumption, leading to GDP growth.

However, some criticism should be risen. The causality between house prices and GDP growth is only proved for house-owners, as renters will not experience an increase in perceived wealth when prices go up, no, vice versa. Besides, stating that stimulation of real estate prices will stimulate the economy is somewhat short-sighted. Levying additional taxes on buildings for example does more likely slow economic growth instead of accelerate. That is, unless income increases proportionally.

Still, the fact that real estate prices are a good proxy for the success and the economic growth of a city still stands, which is the reason that this paper investigates the impact of iconic architecture on these real estate prices. Where one might argue that spillover effects of certain things (like the theatre in chapter 3) are not financial (but rather cultural, educational) this will still translate into higher demand of the benefitting real estate, resulting in higher prices, according to basic economic demand theory, through amenity theory that will further be discussed in chapter 5.

This chapter will present ways how spillover effects of architecture on real estate prices can be recognized and measured. It will separate the difference of the effects on real estate between residential and office areas.

Where I earlier assumed that externalities are present for the aesthetic aspect of architecture in the painting example of my house, this is supported by research and not only is the case in design, but also holds for the functionality of architecture. For example, Ahlfeldt has done a lot of research on the effects of sport arenas / stadiums on the value of real estate properties in the neighbourhood. There appears to be a solid correlation. In one research, on three multifunctional sport arenas in Berlin, Ahlfeldt & Maennig (2009) use a difference-in-difference approach to check the impact of the realization of these arenas in their neighbourhoods. The three arenas (both form, function and location) were intended to revive deprived areas in Berlin. And with success, as the research suggests that positive externalities on location desirability are indeed present, giving rise to land prices which can be seen as an indicator of urban development as I will explain later. However, the research also suggests that negative externalities may be present when they are not addressed during the planning of the projects. In their case, congestion problems did somewhat neutralize the positive externalities of the stadiums that could have been avoided by providing underground park. Congestion problems often emerge when locations become more desirable and therefore require early expectation and anticipation. The construction itself does also yield negative externalities during construction because of nuisance, but these are temporal effects that do not meet up with the positive effects of these architectural projects on real estate values in the neighbourhood.

**Recognizing externalities**

Being able to recognize and measure externalities is a basic condition when attempting to reach social equilibrium. Imagine Bob, a project developer, who is thinking about creating a new skyscraper on the ‘Kop van Zuid’ area in Rotterdam. Most likely Bob’s proposal’s profit would be privately optimized. To show how something like that might look, I created a figure (4.1) that explains the relationships between the components of my project.

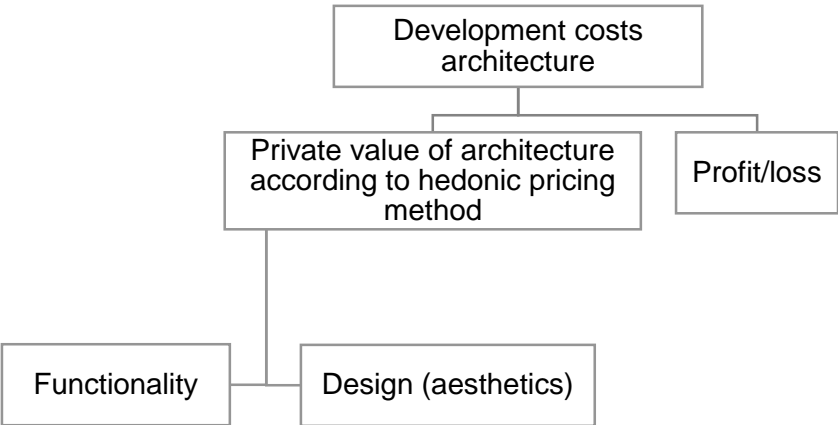


Figure 4.1 – Private approach project development

As in any production process, there will be an ex post noted profit or loss on operational activities. This is the difference between the private value of architecture (market determined, based on value, revealed by the sale or rents) and the manufacturing costs.

As project developer of this skyscraper Bob wants to be ex ante able to estimate the value of his final project, so that he can budget the costs and benefits of the profit. Key in estimating real estate value is the hedonic pricing method. This method states that real estate prices are dependent on several pillars, like quality/functionality of the building, size and geographic location. Li & Brown (1980) were the first economists to include location-specific attributes of the micro-neighbourhood in their estimates of hedonic housing prices. In their research, they classify micro-neighbourhood variables into three types: aesthetic attributes, pollution levels and proximity. In here, the aesthetic type variables are most relevant to this paper. They state that the value of aesthetic quality is well understood, but the contribution of such variables has never been estimated before. With the expectation that houses in attractive neighbourhoods or on attractive sites have a higher value than similar houses in less attractive neighbourhoods or on less attractive sites, they started their research. Although their empirical research showed a significant effect of 'on-site visual quality' (price differential between highest and lowest index amounts to \$2.520, where noise pollution for example only reduced housing prices by \$460 for each doubling of the perceived level of loudness), difficulties in interpreting the neighbourhood proxies were found as well. Therefore, more research on this topic was needed.

In this regard it is relevant to make sure that architectural quality actually matters in the private value of buildings. If I want to support the idea that a premium of architectural quality of buildings are present *because of* the positive effect they have on their neighbourhood (resulting in social welfare equilibrium, instead of just private) I need to know the effect of architectural quality on the price of the buildings themselves. To illustrate this I have the following example.

We still have Bob thinking about building a skyscraper in Rotterdam. A basic, 'merely' (this can be disputed) functional office skyscraper would cost him around 250 million euros, while a more aesthetic project, like the 'De Rotterdam' from the introduction is estimated to cost 340 million euros. The fictive cost differential of 90 million euros exists of two elements. First, there is a contribution of architectural quality of the building to its value, which is perfectly justifiable through private profit maximization. Then, there is (or might be) a certain premium that cannot be explained through private profit maximization, but is simply a contribution to the social welfare, through the external effects of the building. If Bob would be able to quantify such a premium, he might be able to get this subsidized by the municipality.

It is therefore of interest to describe the social considerations that could (or should?) be present in the planning stage of architecture. To graphically show such relations, I created figure 4.2 that is the 'social' alternative to the 'private' 4.1.

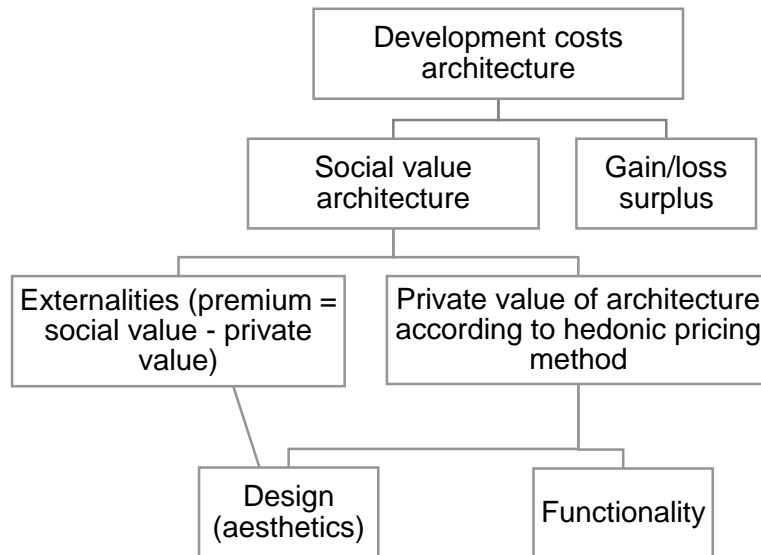


Figure 4.2 – Relationships between aesthetics and externalities, social premium

One way to recognize this premium is to calculate the total development costs of such iconic buildings that can be explained through private profit maximization. As mentioned, this total will include the “base costs” for functionality (for simplicity this also includes standard hedonic pricing attributes like geographical location, proximity and pollution) and a contribution of architectural quality. Vandell & Lane (1989) attempted to empirically evaluate the nature of the contribution of architectural quality to the value of buildings. In their research, they used disaggregate cross-sectional and longitudinal operating performance and amenity data from a set of 102 class A office buildings in Boston and Cambridge. Although not all of these office buildings might meet the definition of iconic architecture I have set in chapter 2, the results of the research will hint us in the right direction with some findings on the contribution of architectural quality on the value of buildings. Vandell & Lane found that there is a strong influence of design (defined as aesthetics, thereby separated from mere functionality) on rents (private value of buildings): the buildings rated in the top 20% for design quality were predicted to extract 22% higher rents than the buildings in the bottom 20%. (They also found that good design would typically have higher development costs, although not in every case.)

I have now shown the role of the bottom two boxes of the figures, design and functionality, in the value estimations of architecture. However, the key aspect in attempting to prove that a certain premium can be distinguished (and the reason why I included this “lowest level” of variables in the model) is whether or not the relationship between Design and Externalities can be proven. This is harder, since simply proving that being close to ‘well designed’ buildings increases the utility of users of a building (following the hedonic method) is not enough. Confounders must be distinguished. Gat (1998) also shows that urban focal points influence rents, but draws some interesting points of attention. The increase of rents near buildings with a high level of design is not necessarily proving the presence of externalities of those buildings. Gat shows four factors that influence office user utility (hence office rents) in **figure 4.3**. In order to understand the actual relation of spillover effects of architecture in the office sector, these factors

have to be explained and unravelled. This will help finding the factor that is relevant in identifying spillover effects of architecture and quantifying that.

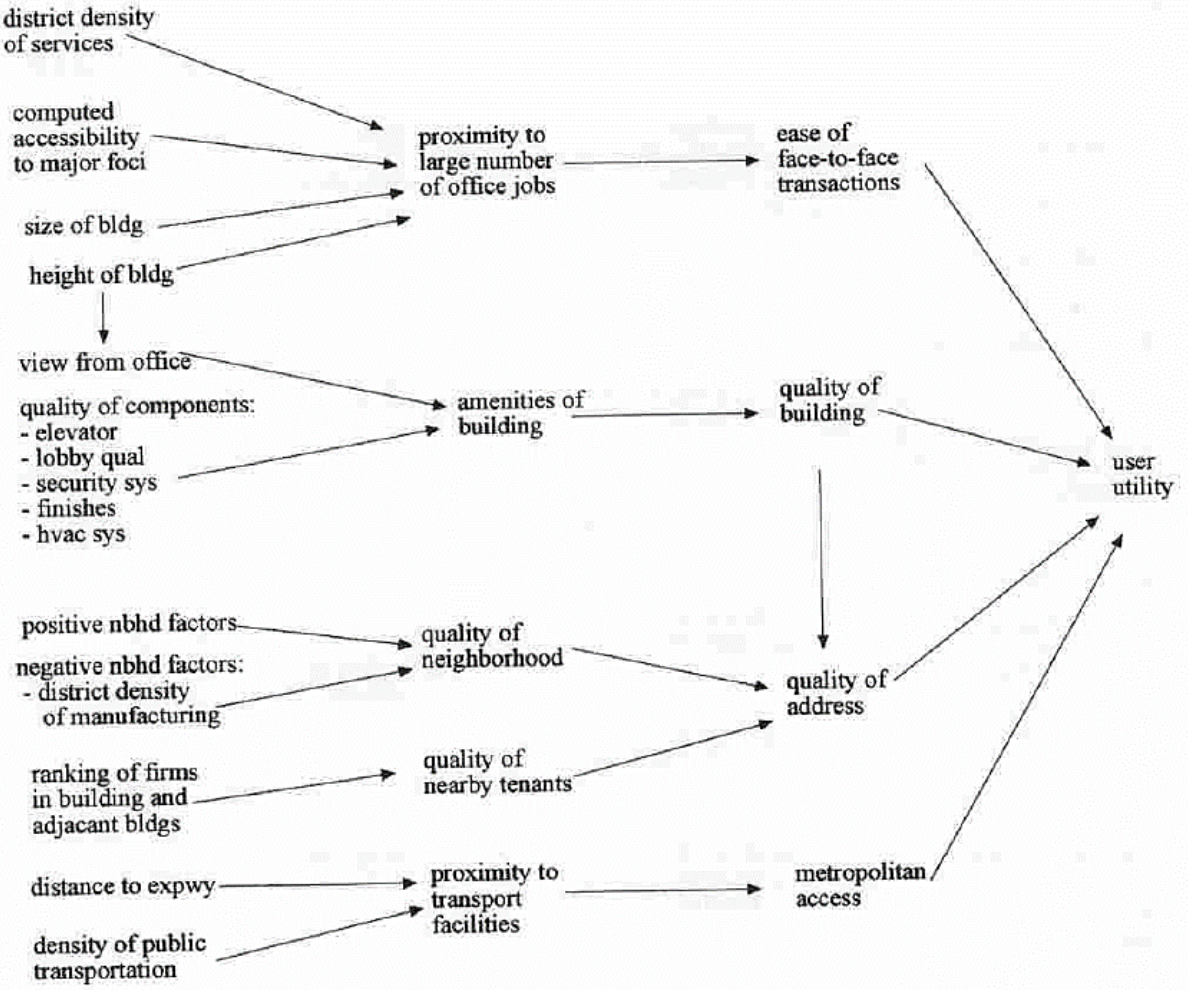


Figure 4.3 – 4 factors influencing user utility (rents) of offices (Gat, 1998)

The first factor is ease of face-to-face activity. The importance of face-to-face activity for office productivity has already been extensively researched and is considered to be the main cause for office sector agglomeration economies. In short: the closer your office is to other offices, the better. This factor raises an interesting discussion on the relevance of proximity in external effects of aesthetics. Although face-to-face activities in its conventional definition may not seem to be additionally present in iconic buildings, the proximity matter is. I will first mention the other three factors of Gat’s research before coming back to this.

The second factor Gat describes is the quality of physical amenities. For this he uses objective attributes of buildings, like age, height, security, internal finishing and styling, circulation etc., building forth on work of Vandell & Lane (1989) and Doiron, Shilling, & Sirmans (1992) as I have done in this paper.

The third factor is the quality of address. Gat states that managers often consider the quality of address when making location decisions. This is again a relevant factor to this paper, as the quality of address



is the sum of the result of three questions, namely 1) a question on the (prestige level) of immediate tenants, 2) a question on the visual pleasantness and 3) a question on the design quality of the surrounding district. The visual pleasantness and quality of the surrounding district prove that design quality of architecture does indeed yield utility for surrounding buildings.

The fourth factor is on accessibility. Utility of the use of offices increases when the offices are close to transport facilities. This is one of the reasons offices often are located in areas with good infrastructure.

But how far do positive benefits from iconic architecture spill over to? To the immediate neighbourhood for whom the architecture is a focal point? To the district? To the entire city? I have drawn a schematic overview of these different levels of distance (d), in figure 4.4.

Using the fame aspect from Sklair’s definition of iconic architecture, one could defend that iconic architecture does not depend on the proximity of the city. All these three levels can be defended, I will start with the latter. When we think about the Statue of Liberty, New York automatically comes into mind. Same counts for the Guggenheim museum when thinking about Bilbao. This level of externalities is even called the ‘Guggenheim’ effect in some researches (Plaza, 2006). Externalities translate into tourism benefits and cities with iconic architecture are more appealing to be hosts of events. It must be noted that the effect of this level on real estate prices is not yet supported by literature and is quite indirect. Iconic architecture does make cities more attractive, as I will show in chapter 4, in time resulting in increased real estate prices (again due to the basic economic theory of demand).

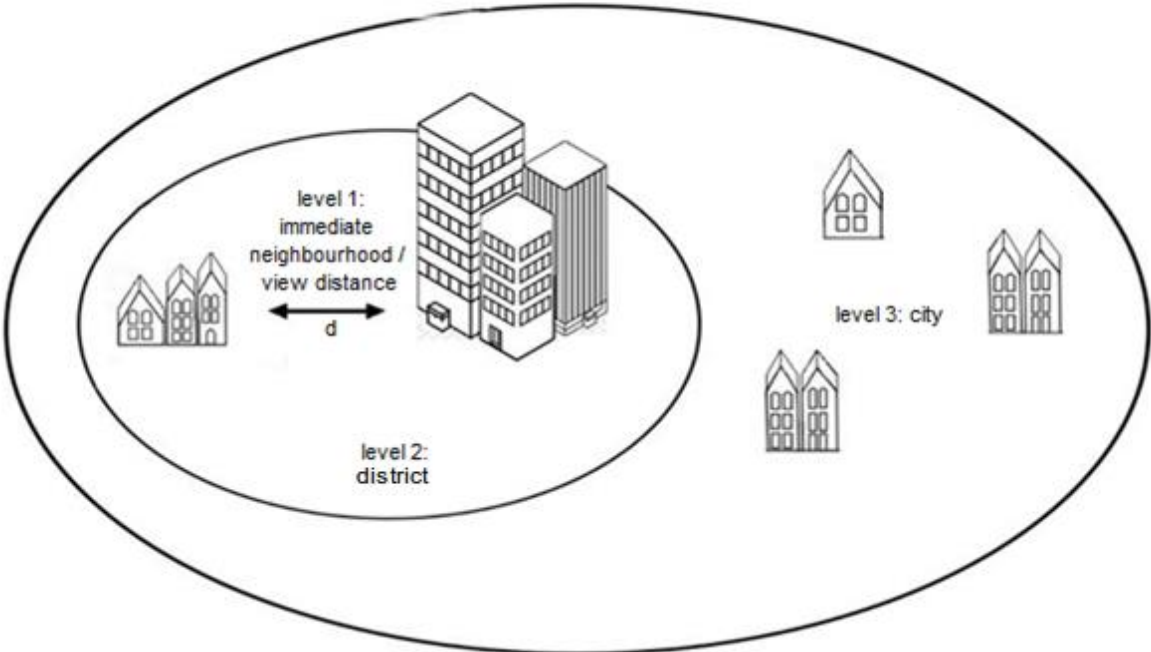


Figure 4.4 – three different distance levels of externalities

The effect on districts is likewise. Literature supports that architecture creates an image with which citizens identify themselves, resulting in a certain level of prestige-spillover (Gat, 1998). Inhabitants of

the 'Kop van Zuid' area gain status and prestige by the overall image of the area. Similarly, the effects of the presence of the SS Rotterdam ship on the surrounding (deprived) district Katendrecht has been investigated, and positive externalities have indeed been perceived. A report of SEV shows that the residential area of Katendrecht has become more attractive and that consumption and production in the area has grown. This level of effects are often called catalyst-effects, as they help increase the effect of other inputs (SEV, 2010). The range of distances in this level of externalities form the iconic architecture differs in various researches. 3-5km is used by Ahlfeldt & Maennig (2010) to investigate the effects of stadiums on the neighbourhood, Koppels et al. (2011) use ranges of 250m, 500m and 750m to investigate the negative impact of vacant office buildings on real estate values.

De Sousa, Wu, & Westphal (2009) assessed the effect of publicly assisted brownfield redevelopment on surrounding property values. The first of four research questions of this research yields interesting conclusions. The first research question asks about the effect of the redevelopment of a brownfield property on nearby residential property values. For this, data of 178 brownfield properties in Milwaukee, Wisconsin and Minneapolis, Minnesota is used. The findings of the paper are as can be predicted, in line with the sign of the relation described in chapter 3: the redevelopment of the brownfield projects do not only yield positive economic for themselves, but also that spillover effects are present and surrounding home values significantly increase.

The effect on immediate neighbourhoods with views of the iconic architecture is empirically supported by various researches. In 2009, Jim & Chen published a research on the value of scenic views. They assessed the effects of different types of views on the value of 18 private housing estates in a residential district in Hong Kong. In this research a very important issue is raised, that of diverse preferences of citizens. Where many people in residential areas prefer to have a natural over built environments (Kaplan & Kaplan, 1989; Hartig & Evans, 1993), this paper reveals difference within these groups. Mountain views depress house prices by 6,7%, where harbour views (both natural / iconic) increase the value of buildings by 2,97%. This research also used the hedonic method to estimate the external effects of various views and factors on house prices. This was measured using a dataset of almost 1500 transactions in 2005-2006.

Spillover effects of iconic architecture on real estate values differs from the types of real estate. This can be explained using the four factors Gat uses, even though he created the model for use in the context of offices. The advantages of high face-to-face activities are much more present in the office sector than in the residential sector. Where this results in higher office buildings (vertical transportation is cheapest) with corresponding higher values, house prices negatively correlates with the height of architecture. House prices on the contrary, benefit more in the first two levels of proximity, through the prestige and aesthetic attributes that iconic architecture draws, where offices are again more interested in accessibility.

## 5. YIELDS OF ICONIC ARCHITECTURE

Earlier I have assumed that economic development is one of the goals and responsibilities of a municipality. This chapter will discuss if and how cities (the 'biggest context' defined in chapter 4) benefit from iconic architecture. To understand this, I will have to briefly explain the concept growth and contemporary theoretical views of explaining and causing growth. In 1992, Mankiw, Romer, & Weil published a research in which they present and empirically defend an augmented version of the Solow growth model. The Solow model of growth was created by Robert Solow in 1956 and describes how the optimal level of growth should be reached. The augmented version fitted cross-sectional data much better, through introduction of the variable human capital. The term human capital was not new, as early economists like Smith (1776) and Pigou (1928) described this long before. It was the first time that the stock of human capital in an economic entity was empirically linked to growth. Human capital can be seen as the stock of competencies, knowledge and personal attributes that (are expected to) deliver a certain level of labour, leading economic growth. Human capital is often operationalized in researches by measuring the amount of agents with at least a BA-degree (Mellander & Florida, 2006).

Given the (ultimate) goal of urban areas to develop economically, the relationship between intermediary factors should be recognized. Through backward induction, starting with economic growth, several factors have been proven to be present in this paper. Where presenting a full model on how economic growth of urban areas works would be too complex for this paper, I do want to highlight some of the relationships, mainly by discussing the amenity theory of urban development that links the rise of amenities (like iconic architecture) with the rise in the human capital stock of a city with the rise of economic growth of urban areas and criticism on this approach.

In 1988, economist Lucas firstly identified the role of externalities of human capital in the economic development of urban areas. Lucas' theory has been empirically verified in more recent research (Glaeser, 1994; Glaeser, 1998; Glaeser, 1999; Glaeser, 2003; Simon, 1998). The importance of human capital is now widely agreed on, resulting in the interesting topic how cities can attract human capital. Different researchers hold on to different points of view in this, and I will briefly discuss the lines of thought of Glaeser and Florida, who both have contributed significantly to research in this domain.

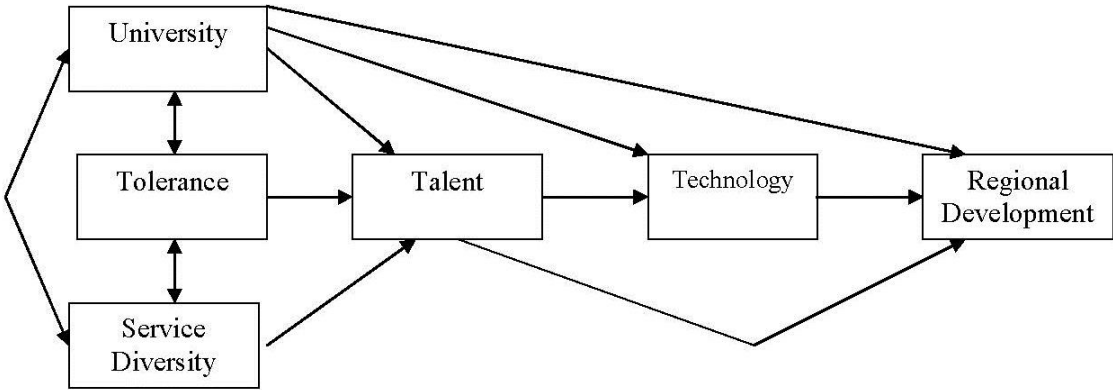
To start with, Glaeser states that urban success comes from being an attractive consumer city for high skilled people (Glaeser, Kolko and Saiz, 2001). Glaeser supports the ideas of earlier economists like Alfred Marshall, Jane Jacobs and Paul Romer, that creativity and innovation are crucial to economic growth. He reasons that human capital predicts urban success because "high skilled people in high skilled industries may come up with more new ideas" (Glaeser, 2003). The main focus of Glaeser is thus on attracting human capital to cities by providing relevant amenities to the high skilled people.

Florida differs on this core drive of urban success. Florida became well-known in 2002 by the release of his book 'The Rise of the Creative Class' in which he basically attributes economic growth of urban

areas to the existence of “creative capital” (Florida, 2002). He states that, after doing research based on the human capital measure, he found a way to better match the data that he found to a model. This new model included creative capital, measuring the occupational data instead of educational data (human capital is often measured by taking the percentage of people with a B.A.). Florida agrees with Glaeser (and the other earlier mentioned economists) that human capital is the primary driver of economic growth. He differs however with Glaeser on how to attract high skilled people. In his 2002 book Florida introduces the famous bohemian and gay indices, stating that the presence of artists and homosexuals have a positive influence on the presence of human capital and thus on economic growth. This process, called gentrification and originating in the word ‘gent’, describes how deprived areas are brought alive through students and the creative class that are attracted by low (or absent) rents, historical value and high proximities. When the creative class agglomerates, new business will be attracted to that district, resulting in new opportunities for investors and a positive spiral effect leading to a vital district.

This is where Glaeser placed his question marks and doubts, in a public review of the book of Florida. By performing own regressions on the data used in the book of Florida, he came to the conclusion that creativity of course matters, but that there is no hard evidence to suggest that this diversity or Bohemianism that Florida defends has any impact on economic growth when you control for the present human capital, supporting his earlier work that creativity matters, but is driven by human capital. In his response, he states that: ‘As such, mayors are better served by focusing on the basic commodities desired by those with skills, than by thinking that there is a quick fix involved in creating a funky, hip, Bohemian downtown’ (Glaeser, 2004).

Florida does agree with this to a certain extent, by stating that neither the presence of amenities nor the presence of bohemians and gays account for human capital to be attracted to certain urban areas. The real reason, according to Florida, is openness, or tolerance, one of his three Ts of urban development. In later work in cooperation with Mellander, he presents a model on urban development, **figure 5.1**



(Mellander and Florida, 2006).

Figure 5.1: Model of key regional development paths

The arrows in this model are the relationships between the key variables in the process of regional development. It is important to mention that the lines do not express actual causalities, but direct and

indirect correlations. Here I see that tolerance (or openness), the service diversity (Glaeser’s amenities) and the presence of a university (dummy variable) in the specific region are the variables that attract talent (human capital).

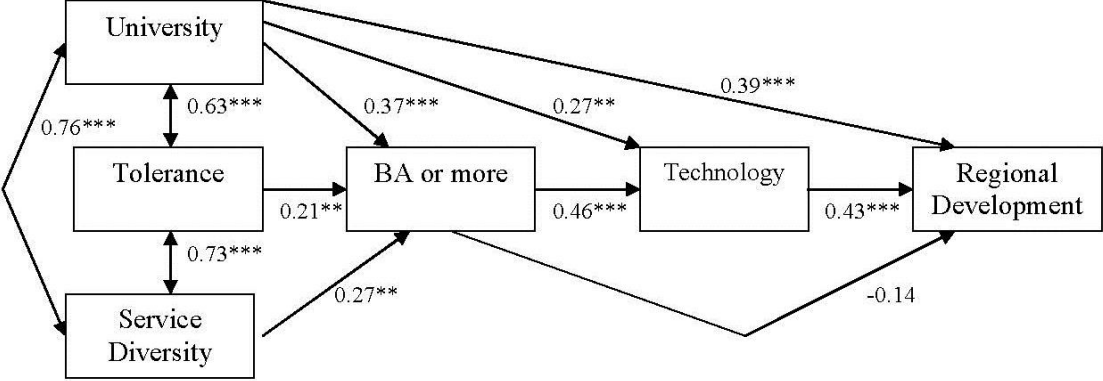


Figure 5.2: Path analysis for human capital

Where the words ‘iconic architecture’ are not literally written in this model explaining urban development, it is certainly present. When stating that urban development follows the presence of human capital (talent), the question on how to attract talent is by both service diversity and tolerance. Service diversity has already been defined as the total of amenities a city provides, of which iconic architecture certainly is one. Marlet (2009) concludes his book on attractive cities in the Netherlands as following: cities with high service diversity and amenities attract a creative and well-educated population. This causes the stock of human capital to rise, resulting in growth of job opportunities which in turns increases the attractiveness of cities, resulting in increased house prices etc.

Aesthetics are denoted as the most important argument for the establishment location decision by U.S. graduates (Florida, Steiger, & Wilson, 2006). Cities do therefore absolutely benefit from investing in iconic architecture.

Not only cities benefit from creating iconic architecture. Following Sklair, also architects gain fame by creating iconic architecture. Given that more and more evidence comes from research to support the economic benefits of iconic architecture for cities, architects increasingly use this to persuade municipalities to choose for the more prestigious proposals.

## 6. CONCLUSION, RESTRICTIONS AND RECOMMENDATIONS

### 6.1 Conclusion

In this chapter I will conclude this research, by answering the sub questions and successively the main research question.

*Subquestion 1: What does the term iconic architecture mean to economists?*

Economists have an ambiguously feeling towards the term iconic architecture. On the one hand, they are not social scientists that can/should recognize and determine the iconicity of things. On the other hand, in research they will have to operationalize the concept and therefor often use a binary scale (true or false, iconic or not) in their research. Instead of operationalizing iconicity in a true/false manner, one could argue for an index, a continuum scale. This would require more empirical research to identify variables and their coefficients, and a good theoretical definition of architectural iconicity. Current popular definitions include terms like 'fame' and 'aesthetic significance', but these are rather vague and not yet measurable. Where a theory-based definition misses, iconicity may be assigned by the public and professionals, for example through questionnaires.

*Subquestion 2: What does economic theory say about recognition and measurement of spillover effects and impact of activities?*

Classic welfare economic theory states that the social welfare optimum often differs from private welfare options and that governmental intervention can help to reach the desired state and therefor is desired. More recent research agrees with the first but differ on how to reach the desired state by stating that governmental intervention often does not result in the desired state. A 'social premium' (difference between social and private optimum) can be recognized only if the total benefits are known. In the real estate market this is a fragile point that requires more research, as no real way of indexing is available yet.

*Subquestion 3: What spillover effects flow from iconic architecture in urban areas and how can these be measured?*

Iconic architecture have spillover effects on real estate on three different levels: the immediate neighborhood that have a view of the architecture (prestige from seeing the Erasmusbridge from your window), the district (prestige from living in the Kop van Zuid area) and the city as a whole (prestige from living in Rotterdam, a modern and artistic city). The Willingness-to-Pay is higher for real estate that benefit from such spillover effects from iconic architecture and can be measured. Where the spillover effects are not primarily financial (in the case of iconic architecture rather aesthetical), they will find a translation into the value of real estate, through the WTP axiom. Besides the WTP axiom (subject of this essay), effects can also be recognized through increases in tourism and catering places.

The effect consists of four factors and three spillover ranges: immediate neighbourhoods (with views on the architecture), districts and cities. The four factors determining user utility (hence rents) are ease of face-to-face activities (related to proximity), quality of buildings (objective properties), quality of address (aesthetics and prestige) and metropolitan access (accessability).

*Subquestion 4: How do cities and project developers benefit from the presence of iconic architecture?*

Cities benefit from the presence of iconic architecture since it increases the value of the city through prestige, resulting in competitive advantage over other cities. High educated people typically want to live in attractive cities, or cities with a high level of amenities. Prestige through architecture is one of these amenities that attracts high educated people. High educated people in turn are one of the most important causing factors for urban development. According to economic theory, project developers will benefit from the spillover effects of iconic architecture in the way that they will more easily get subsidies from local governments to realize the 'iconic' premium in their projects. In other words: they will no longer have to plan 'underproduction' of the aesthetic component. This results in more fame of their works.

*Main research question: What economic theories describe the impact of iconic architecture on the value of real estate in urban areas?*

The impact of iconic architecture on real estate in urban areas is on three different levels, based on both objective as aesthetic components. Architecture has the power to give rise to utility of real estate (thus rents) and to increase the prestige of a city as a whole. This leads to a competitive advantage over other cities, resulting in an increased stock of human capital which in turn is a proxy for urban development. Where certain buildings in essence can yield positive or negative externalities, this in case of iconic architecture is almost always positive, partly due to the definition of the iconic.

## **6.2 Restrictions**

The findings summarized in 6.1 have their restrictions. As mentioned in the introduction, one of the major assumptions behind much of the literature is the Rational Choice Theory that backs up the Willingness To Pay axiom. Where RCT is often assumed in economic studies as a way of rendering behaviour of agents in a 'close-to-reality' simplified manner, there is sound criticism. For this paper this would mean that the empiric-based literature is less reliable and that the spillover effects cannot be properly distinguished in the real estate values.

A second limitation is that certain relations that this paper proposes are not very rich on empirical validation. Where relationships like between human capital and urban development are very clear and generally agreed on, the relation between aesthetics attributes and property values for example does not yet have much empirical foundation. Besides, the data used can sometimes be questioned. Since there was not many, there may be errors due to results that are affected by changed economic situation within the dataset or cultural/social events that affect house prices but were not accounted for in the

sets. Also, relationships may have changed over time; the effect of design quality on rents indicated in the 1989 Vandell & Lane paper for example may not anymore hold.

Another restriction is that researches that were used for this paper have not always been clear on the distinction between different types of real estate. Where I have tried to separate effects in the different sectors, I still think that this distinction could use more data for backing up.

### **6.3 Recommendations**

I would like to suggest further research in two directions. First, and most importantly, the idea of an 'iconicity continuum' could be further explored. Within the different real estate sectors a regression could be invented to quantify the scale. This regression could be made up following the line in this research (by finding coefficients of objective and aesthetic qualities of buildings) but, maybe even more interestingly, the regression could also exist of 'impact variables'. Quantifying the impact of iconic architecture is still not a solid economic practice, so further research could help identifying and quantify the important factors so that coefficients can be used in further works.

More importantly, I would suggest that research on the benefit of iconic architecture for the public. Where economic theory proposes that support/intervention from local authorities can be expected when there is a clear difference between public and private equilibria, such research could investigate if this actually occurs. Public support of course includes the financial measures like subsidies and taxes, but also ease of legislation, zoning restrictions, land prices and other synergetic solutions. The latter has been mentioned in the introduction as a current debate in the city of Amsterdam, where the local authority and project developers try to work together and get rid of the free-rider effects that externalities of public goods usually bring on.



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