Assessing the Effect of Architectural Design on Real Estate Values:

A Qualitative Approach

by

Jason Arden Millhouse
B.A., Architecture, 1997
B.Arch., 2002
Rice University

Submitted to the Department of Architecture in Partial Fulfillment of the Requirements for the Degree of Master of Science in Real Estate Development at the

Massachusetts Institute of Technology

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Signature of Author ______________________________
Department of Architecture
August 5, 2005

Certified by ______________________________
Lynn Fisher
Assistant Professor of Real Estate
Department of Urban Studies & Planning

Accepted by ______________________________
David Geltner
Chairman, Interdepartmental Degree Program in Real Estate Development

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ABSTRACT

It has long been known that 'good' architecture and quality design are public goods, as they have been shown to increase surrounding property values, create a sense of community, and provide a catalyst for future development. What is less clearly understood is the individual user's demand and willingness to pay for good architecture; if there is a positive externality to quality architecture on the surrounding buildings, tenants, and bystanders, then there must exist a 'socially optimal' level of design that may or may not be equal to the optimal level as measured by the private market. Through interviews with industry leaders and policy makers, and a careful reading of relevant literature, this study seeks to investigate the discrepancy between the socially and privately optimal levels of design, and to determine the degree to which 'good' architects or 'good' architecture can affect private returns to private developers or owners.

More simply put: does there exist a private market for 'good' architecture within the market for real estate?

Thesis Supervisor: Lynn Fisher
Title: Assistant Professor of Real Estate

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1.0 INTRODUCTION

The external form of a building is generally neither rival nor excludable, and therefore can usually be considered a public good. In fact, there is little doubt that 'good' or 'high quality' architecture is a public good, one that creates positive externalities for the surrounding structures and communities. (Bourassa *et al.*) This concept of quality architecture as a public good explains, in part, the existence of historic districts, design reviews, planning boards, and government-imposed aesthetic requirements for permitting. It is also generally accepted that, as a whole, the construction and design costs to produce 'good' architecture are higher than those required to produce buildings that are of a more questionable or less 'unique' design quality. (Lane and Vandell, Hough and Kratz) If there is a positive externality to quality architecture on the surrounding buildings, tenants, and bystanders, then there must exist a 'socially optimal' level of design that may or may not be equal to the optimal level as measured by the private market. The quest here is to investigate the discrepancy between the socially and privately optimal levels of design, and to determine the degree to which 'good' architects or 'good' architecture can affect private returns to private developers or owners. More simply put: does there exist a private market for 'good' architecture within the market for real estate?

1.1 Two Interacting Markets: Products and Inputs

A private market for good architecture can only exist if the users of the building have a willingness to pay that is higher than the opportunity cost to the developer of creating such buildings. Thus there are two main market functions at work: the demand for space and the demand for the inputs that create space. (Figure 1.1.1) Users (and the community) demand a certain amount and quality of space, and that space is supplied via production by *supply-side agents,* such as developers, landlords, and, to a lesser extent, homeowners and

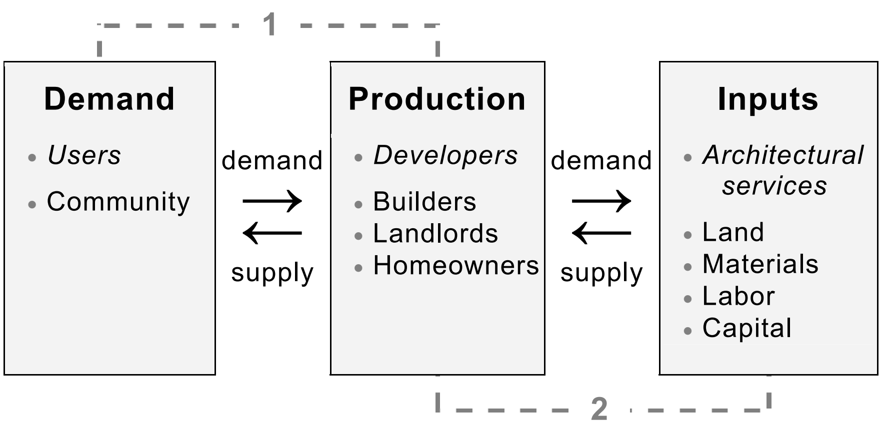

Figure 1.1.1: Interacting Market Functions

Source: Adapted from Green and Malpezzi renters.[1] (Green and Malpezzi) Based on the level of demand for space, supply-side agents will demand a certain level and quality of *the inputs* of space. Architecture and quality design are inputs of space that are demanded by the developer so as to supply high-quality designed space to users. The level of design demanded by the developer is based in part on the perceived *private user* level of demand for high quality design[2]. It is necessary, then, to not only understand the supply of quality architecture, but also the demand drivers for the consumption of this architecture. In an efficient market free of externalities, the supply and demand for quality architecture between the developer and users should always be equal; however, with the 'public good' nature of architecture, in the face of externalities there is always the possibility of a market failure. A market failure occurs when there exists a gap between the level of quality design demanded by the users of the space

[1] Homeowners and renters can be considered supply-side agents because they demand the inputs of housing services in order to maintain and upgrade their homes. Homeowners and renters, however, will be largely ignored in the context of this paper due to their relatively minor use of architectural services.

[2] There are other factors that affect the level of design supplied, such as community and government regulations, which will be discussed later in this paper.

and the total social demand.[3] If supply does not equal the socially optimal level of good design, what methods can local authorities use to decrease the opportunity costs or increase the financial returns to developers such that the supply of quality architecture is equal to the total social demand rather than the private demand only?

In response to the demands of the users of space, the developer will likewise *demand* a certain level of service at any given price, while the architect in turn will *supply* a certain level of service at any given price. The architect's supply should be partially based on his or her cost of providing such services, determined by the opportunity cost of inputs such as labor, materials, time, etc. The developer's demand for such services in an income-producing property will be based mostly on the perceived return he or she will gain from an investment in these services. The economics of housing services assumes that both the producers and users of space are *price-takers*. (Green and Malpezzi)

[3] Total social demand is the socially optimal level and defined as the total demand of space users and the demand of bystanders, passersby, and neighbors. All persons or groups who receive a utility from the space but do not pay for it will be referred to as "*the community*."

In a competitive market with few barriers to entry or large economies of scale, only the developer's actions should affect his/her final return. However, as the users of space demand more quality-designed space, the developer's demand for good architectural services should increase in response, as his return may be critically affected by the actions of the architect. This increase in demand for architectural services should, at least in the short-term, increase both the supply and cost of the services provided by architects. In fact, with a differentiated product, the increase in cost should be even greater, as each architect has a 'mini monopoly' on his or her 'style' and services. However, given the commonly known fact that architecture is not a high-return profession, what is it about the relationship between developer and architect that seems to defy the laws of economics?

To answer this and other questions, this paper will first examine the existing literature pertaining to the market for quality architecture, including the supply and demand drivers associated with the creation of such buildings within the public and private markets. As good architecture can be considered an amenity rather than a necessity, the paper will also examine the body of literature related to the pricing of various other amenities within the residential market. Next, with the goal of understanding the supply and demand drivers behind the creation of good architecture, the paper will then cover necessary background information related to the contractual governance structure of architectural services between owner, architect, and contractor, as well as the typical financial billing principles related to such services. Finally, after a series of case discussions of recent Boston-area development projects, the paper will conclude with suggestions for future study.

2.0 DEMAND AND THE MARKET FOR "GOOD" ARCHITECTURE

There are obvious social benefits to good architecture; neighborhood gentrification, increased property values, increased tourism and foot-traffic, and increased safety, to name a few. However, most buildings are funded and developed by private individuals, and not from society as a whole. This obviously creates the potential for a free-rider problem, as there is potentially no incentive for the neighbor, who will benefit from increased property values, to pay for good architecture. Thus the socially optimal level of good design might diverge from what is privately optimal. Short of government intervention, however, the socially optimal level will never be reached unless there is a private benefit from, and a private demand for quality architecture.

2.1 Public and Private Valuation of "Good" Architecture

The question of good architecture is a question of the relative benefits and costs of architecture's stakeholders. As each stakeholder's value proposition is different, it is first necessary to understand both the public and private values and costs associated with good architecture. While the focus of this paper will be on the market for quality design within the private real estate market, it is necessary to also understand the relationship between the public and private demand for such architecture. However, the question of design has been studied very little within an urban or spatial economic context, and thus precious few academic articles exist on the subject for *any* market. (Lane and Vandell) The lack of multiple studies on the question could be based on the difficulty of obtaining data, but is more likely the result of the difficulty in quantifying or defining “quality design” as an amenity, as it is often a question of subjective perception. Likewise, the value gained or created through quality architecture is not always financial or direct, but can take on many forms; in assessing the value of good design, one must take into account not only economic value, but social and environmental value as well. These various forms of value can add difficulty to the quantification of design, as the indirect value can often be as great as the direct financial value achieved through design. Finally, while the value of design is relative between stakeholders, it is also relative to other factors imposed on the architecture, such as market conditions, the building’s use and use groups, as well as the local political climate. (Carmona, *et al.*)

As the various stakeholders associated with the building will define the costs and values for themselves, it is the goal of this thesis, in part, to investigate those costs and values, and determine the extent to which they affect the production of good design. A clear comprehension of each stakeholder’s costs and values is necessary to understand the decision-making process of design within the context of real estate development. As the genesis of a building is a long and complicated process, involving many factors and many players, the costs and benefits of each must be aligned properly for the building to come to life. As the costs and values change relative to the market, the resultant quality and character of the architecture should, in turn, also change. For example, the developer's values and costs are relative to both the cost of construction and the value of the end product; as the demand for high-rise housing increases, and at the same time the cost of steel falls, the market should see an increase in high-rise construction. However, if the both the demand for high-rise housing and the cost of steel rose, an increase in supply would only arise if the value to the user/buyer rose more than the cost to the developer. Likewise, as the value of mixed-use property rises for a municipality, the economic or opportunity costs for developers will fall for mixed-use property as permitting and entitlement becomes faster and easier, resulting in an increase of mixed-use property. Thus the benefit and costs of each individual stakeholder is relative to the benefits and costs to each other stakeholder.

Although not always historically the case, developers are beginning to see the market value of good design. Some developers have speculated that quality landscape alone can account for a 5% premium in rents or sales over the competition, while others attribute as much as a 15%

increase in return to quality landscape. (Bookout) Thus good design will continue to be a priority as long as the *costs* to the developer are less than the *value* to the user.

To understand the value of good design of each stakeholder, one must examine the issues relevant to each party. Through case studies, readings, and discussions with users, architects, and developers, this thesis identifies four key issues relevant, to varying degrees, to each stakeholder.[4]

1. *Direct economic performance*: the pure investment value of the project based on rents or sales, vacancy and absorption, among others measures.

2. *Direct operational performance*: the value associated with the design of the building in so far as it adds to, or subtracts from, the operating efficiency and value of the building. This could include management, image, and security, among others.

[4] Adapted from Carmona, *et al.*'s "Six Key Issues."

3. *Cost of design and implementation*: refers to the direct and indirect economic costs associated with design such as production costs, infrastructure, low-income housing requirements, and duration and cost of approval process.

4. *Social costs and benefits*: refers to the direct and indirect value of the development on a wider economic scale such as: safety/ sense of security, sense of place, area and neighborhood revitalization. Social costs also include the environmental value, which is the portion of the building value that is affected by its design and construction as it relates to the environment. Commonly referred to as 'green' architecture, this value can refer to energy consumption, accessibility (transit-oriented design, etc.) and sustainable construction techniques.

Likewise, the identification of each stakeholder is necessary to property align the costs and values. Carmona, *et al.* identified the following as key stakeholders in most development projects:

1. *Investors, both long and short-term*: construction and long-term debt providers, equity investors.

2. Developers

3. *Designers*: architects, landscape architects, engineers, and all other design professionals associated with, and receiving fees from, a development project.

4. *Occupiers*: users in the form of tenants or owners.

5. *Local Authority*: the town, municipality, or other authority that will both benefit and bear some of the costs of the development.

6. *Community*: society as a whole that is affected by the development project.[5]

The relationships among all of these groups will interact to influence either the cost or payoffs from the development project; clearly for a well-designed development to move forward, the perception must be that the costs and values for each group are balanced, both in the long

[5] The extent to which a community is considered a stakeholder in a project is variable. A small development in a rural location may have little effect on anybody, while a project such as the World Trade Center site in Manhattan is of interest to a large number of people all over the world.

term and the short term. Again, using a table similar to that found in Carmona, *et al.*, coupled with qualitative evidence gleaned from readings and discussions, the following summary chart of the benefits and costs of good design can be established:

	Benefits		Costs	
	Short-term	*Long-term*	*Short-term*	*Long-term*
Investors	• Investment security • Higher revenue returns • Increased asset value	• Easier/ Cheaper Maintenance • Increased re-sale value • Continued attraction of high-quality tenants	• Potentially higher initial investment	• Potential for more complex management, especially in mixed use projects
Developers	• Faster Permitting • Greater chance of variance • Less public opposition • Greater product differentiation • Ease of attracting investors	• Increased/ sustained reputation • Ease of attracting future investors and support	• Higher construction and design costs. • Increased design and construction time	
Designers	• Increased work load and billing opportunities/ increased revenue	• Increased/ sustained reputation		
Occupiers		• Better recruiting and workforce retention • Increased productivity		• Higher rents for higher quality buildings

		• Reduced security expenditures • Reduced energy usage and cost • Increased prestige		
Local Authority	• Potential to encourage other development	• Increased economic viability for surrounding community • Increased tax revenue • Reduced public expenditures on crime prevention, urban management	• Higher public investment in design guidance and advice	
Community	• Few benefits until completion of building • Could potentially provide jobs during construction	• Increased cultural vitality • Increased public pride • Reinforced sense of place • Increased property prices • If "green," reduced exposure to harmful pollutants, overall increase in environmental health.	• Increased construction noise, pollution and disturbances	• Threat of gentrification, especially harmful for renters.

Figure 2.1.1: Costs and Benefits for Development Stakeholders

Source: Adapted from Carmona, et al.

As previously stated, the benefits of one group must balance the costs of the other, and vice versa, while at the same time, the costs and benefits *within* each group must also balance. The values for occupiers, such as increased prestige and increased worker productivity, must be equal to or greater than the costs to the developer, but at the same time, those benefits to the occupier must be greater than their *own cost* of obtaining such benefits, such as increased rent. Likewise, the benefit of the community's increased property values must be greater than the threat of gentrification.[6]

However, not only do the costs and values of the various stakeholders need to be aligned, but their time horizons must be aligned as well. Historically, much of the problem with creating good design has been that the cost to the developer is incurred in the short-term, but the value to the user and the public is mostly achieved in the long-term. This is especially true when the developer does not plan to hold the building for the long-term, but rather to sell it off either as a merchant-builder or in

[6] This, however, is usually the case when the majority of a neighborhood is owner-occupiers, rather then renters. It is common, however, for renters to get 'priced-out' of a recently gentrified community.

the form of condo sales. For the developer to spend on good design, the entire direct and indirect long-term value to the user or buyer must be discounted back to the present, and that value must compensate the developer for his or her short-term expenditure on design. This can only happen, however, if the user (buyer) recognizes the value attributed to good design, and is willing to capitalize not only the future *financial* value, but intangibles such as safety and security, cache or image, and the overall feeling of well-being associated with quality design. Thus the developer's goals are predominately short-term and quantifiable, whereas both the user's and community's goals are often long-term and intangible. Carmona, *et al.* discuss the misalignment of these goals, and suggest that through study and education, they can be realigned:

> *Unfortunately, in a contemporary development climate, commercial pressures often seem to militate against long-term investment in design quality. The problem is often compounded because decisions regarding the built environment are often made by those far removed from their impact on the ground. In* [other countries] *in the recent past the result has contributed to a marginalization of …design and to a perception that better design generates costs without a view that these might be offset by any benefits. Nevertheless, by demonstrating that better*

design sits on the positive side of the balance sheet, a change in private as well as public decisions might potentially be secured. (146)

The question of design is, at least in part, one of aligning the costs and benefits of each player, in both the long- and the short-term. If the value of good design to the user is capitalized into the value of the property, the developer's profit should reflect this fact. Likewise, if an increase in profit is attributable to design, the architect's fee (and profit) should also rise, reflecting this increase in value. However, the architect must only be compensated for an increase in value if that increase is real *and* greater than the cost of obtaining such increase. A few researchers, nevertheless, argue that the increase in value does not necessarily exist, but only exists as a lottery; a *chance* that value will be increased. As design costs are sunk before the increase in value is determined, the risk of not achieving an elevated value is raised, which in turn should actually lower the compensation of the architect.

At the very least, it can be shown that the value to *surrounding* buildings is 'real,' as a few studies have examined the value of a view on property values. Through hedonic regression using multiple dummy variables for different quality and view types in Washington State, Bensen, *et al*. determined that the willingness to pay for a view is quite high, but that the premium depends not only on the view itself, but on the *quality* and type of view. High quality ocean views were found to increase the market price of a home by as much as 60%, while views of a lower quality were only found to increase market price by 8%. The authors also determined that the value of an ocean view of any quality is inversely proportional to the distance from the water. Bourassa, *et al*. employed a similar methodology to the Bensen study, using multiple dummy variables for different views in New Zealand rather than a single one to simply represent 'view' or 'no view.' The authors found that wide views (i.e. "high quality" in Bensen) added an average of 59% to the value of a property. The paper also studied the effect of non-water views, finding a 27% increase in price for views of attractive surroundings and a 37% increase in property values for units with views of attractive buildings. When taken in the context of this thesis, the paper shows that exogenous features surrounding a building have an effect on property values, including near-by quality architecture. Neither paper, however, makes any mention of the endogenous features, such as attractive facades, and the effect those features have on rents for the buildings themselves. However, ultimately the studied concluded that, "*aesthetic externalities are multidimensional* and can have a substantial impact on residential property values." According to the authors, users are willing to pay for *views* of good architecture. Clearly there is a social and community benefit to good architecture. However, as an occupier, one actually gains little value from the aesthetic components of the façade; thus the potential for a free-rider problem exists. Are buyers willing to pay to actually own that which creates the externality, rather than simply enjoy if from afar?

This issue of the gap between the social demand and the private demand for quality architecture has been studied very little. To this author's knowledge, two studies have directly studied the question of private demand and valuation by examining the potential added value of "good" design on a sample of commercial office buildings. First, Lane and Vandell (1989) examined 102 Class A office buildings in Boston and Cambridge in a "*preliminary attempt to evaluate empirically the nature of the contribution of architectural quality to the value of buildings*." The authors collected data on design quality for the buildings in the sample via surveys completed by a panel of local architects. This methodology produced results via hedonic regression that showed that buildings rated in the top 20% for design quality were predicted to command rents almost 22% higher than the bottom quintile, but showed a weak relationship between vacancy and design quality.

The authors then briefly examined the construction costs of good design and found that, on average, buildings of higher rated architectural quality cost more to produce. Through this brief examination of construction costs, and a series of point estimates of rent, vacancy, and construction, they ultimately found that good design “may not be more profitable on average, but *as with a lottery, may provide a small probability of a high return to the developer*.”

Lane and Vandell concern themselves only with the aesthetic quality of architecture, making a careful distinction between the external appearance of the building that they are studying, and the functionalism of the building, which is not taken into consideration in their paper. Although the non-excludable nature of good architecture does not extend beyond the exterior façade or any public spaces (e.g., lobby, commercial space) the functionalism and internal quality are a great part of what a buyer is purchasing. Although the user/buyer is purchasing the right to the exterior quality of the architecture, they are also purchasing the right to utilize the functional quality. Nevertheless, their results do point to a private market for good design, and suggest that, buyers are, in fact, actually willing to pay for that which creates the positive externality. Obviously, according to Vandell and Lane, the value of that “cache” to the user is greater than the cost to the developer of supplying such aesthetic quality.

Ultimately, the greatest flaw in the paper is their method of identifying the quality of architecture. They correctly state the subjective nature of their task, but fail to truly translate that into an objective measurement. The authors state that, “market participants would perhaps provide the most direct proxy measure, though they may rely upon designer’s opinions as the arbiters of design tastes.” The authors thus assume that opinions of local award-winning architects are therefore an accurate measure of design quality, and proceed to gather data via questionnaires of 80 Boston-area architects. Ultimately they received 28 completed surveys, for a response rate of 35%.

The errors in this methodology are many: First, while a response rate of 35% is to be expected, 28 surveys is simply not enough for an accurate, objective analysis of “quality”. Secondly, all the architects surveyed were local architects commenting on local buildings, many of which they had designed themselves. It is impossible to tell if the 28 respondents were in fact the design architects themselves, in which case it could be imagined that they might rate their own designs higher than truly warranted. If a similar methodology were to be used, it might be more relevant to select a panel of non-local architects with no connection to the sample buildings. Finally, as the buildings were rated after completion and lease-up, it is difficult to ascertain if the respondents, at least subconsciously, were awarding the status of “high design quality” to buildings that were simply successful on a financial or marketing level. To reach a truly objective quantification of quality, it is necessary to isolate the architectural quality itself, rather than attaching the concept of quality to structures that succeed on other levels (i.e. financial or economic). These flaws notwithstanding, their results do suggest the existence of a private market for quality architecture.

Next (although not chronologically), Hough and Kratz (1983), while suffering from a flaws similar to that in the aforementioned article, frames a question very similar this paper, although exclusively in the commercial office market rather than the greater real estate market:

> *In this paper we ask whether the positive externality of 'good' architecture can be internalized; in particular, is the value of 'good' architecture reflected in the rental rates of commercial office structures in downtown Chicago? …can we establish whether or not office tenants value 'good' architecture at any positive price?* (41)

The Hough and Kratz article, like the Lane and Vandell one, looks at the question from the side of demand, rather than the supply side of the equation. They begin by establishing five features of a building that may influence the demand for office space, with architectural quality being only one of them. The other four are listed as; "distance from the center of the CBD, distance from commuting centers, building responsiveness, amenities and dis-amenities." It is by estimating each factor's separate impact that they are able to isolate the effect of architectural quality on the demand for office space, and thus office rents.

The methodology used is one of hedonic regression in which various measures to control for the five features are regressed against the dependant variable of average rental price in 1978 (dollars per square foot) of 139 office buildings in Chicago. The study uses various directly observable measures to account for the first four of the five factors, and introduces a number of measures to account for architectural quality. New buildings are considered as being architecturally significant if they have been so recognized by some "official" authority.

Ultimately the study found that buildings with Chicago landmark status rent for $0.81 per square foot less than an otherwise similar building without such designation. However, this variable was not statistically significant, but at the very least, *"it can be said that landmark status does not increase the equilibrium rent."* However, the study did find there to be a statistically signification premium of $1.85 per square foot (in 1978 dollars) for buildings that had been given the Chicago AIA award. Although the paper does mention that the "good" buildings cost more to build and design, the differential was well below the capitalized value of $1.85 per square foot. The authors ultimately conclude that because the AIA status is not conferred until after a building is complete, while the higher cost of construction is incurred before such status, architectural quality is akin to a lottery, and the premium simply represents the risk necessary to compensate owners for the gamble of achieving such quality. Ultimately, it is unclear if the rent premium was due to higher quality of architecture, or simply due to the increased publicity from the AIA award. If, however, the increase in rent is due to the increased publicity from the AIA award, does this suggest a reputation or 'branding' effect that carries beyond the building to the architects themselves? If so, the chance of a rent premium for quality architecture could be increased simply by choosing an architect that had previously won an award. If this rent premium could be attributed to the architects themselves, rather than the architecture, it would be expected that the demand for an 'award-winning' architect would be in higher demand than that for a 'non-award-winning' one, and thus the 'award-winning' architect could charge higher fees due to this increase in demand.

Ultimately both papers suggest a rent premium associated with quality architecture within the commercial market. They show that, in general, the user is willing to pay more for quality architecture than it costs the developer to create it. While this suggests an alignment of developer's short-term costs and the user's long-term value, it is also necessary to examine the question in the context of the residential market.

2.2 Pricing Amenities in the Residential Market

As stated previously, few studies have been conducted on the value of quality architecture within the private market. However, due to both the regular appraisal of residential buildings and the requirements of apraising, and the generally public nature of residential sales prices, much work has been done to the study of the effect of other individual amenities on residential prices. (Hough and Kratz) Most studies have examined different amenities and their value on home prices, such the value of views, Victorian Architecture, or parks. Most studies have found that, at least within the residential market, most amenities are in fact capitalized into the sales price of the home. This paper will rely heavily on the results of these studies, and methodology for valuing such amenities within the housing market. In the final conclusion, this paper will seek to adopt that methodology into a suggestion for a quantitative study of the market for 'good' architecture.

Song and Knaap (2003) examined the price of residential real estate in "new urbanist" neighborhoods, the current trend in suburban muliti-plot design, versus that of modern neighborhoods. The authors used GIS

(Geographic Information Systems) to develop quantitative measures of urban form, such as street design and circulation, density, land use mix, accessibility, transportation mode choice and pedestrian walk-ability, which were then incorporated into a hedonic price regression. Combined with a series of variables to control for influences on price other than that of urban form, the authors concluded the value difference between traditional and new urbanist neighborhoods is measurable and is in fact capitalized into residential property values. They found that buyers were willing to pay a premium for more and smaller blocks, proximity to operating light rail stations, and better pedestrian connectivity. They also found that the premium more than compensates for the price discount due to the smaller size of new urbanist lots. Ultimately, the authors concluded the paper, saying:

> *More importantly, our results show that the price premium, or discount, of any particular neighborhood depends on the particular design characteristics it has to offer. In short, design matters.* (236)

Thus the authors found that, not only are people willing to pay for an increase in aesthetics, they are willing to pay for an increase in functionality. In this study, in contrast to Vandell and Lane, the aesthetics and functionality of the project cannot be separated, for it is the interaction between the two for which the market is paying.

Next, Moorehouse and Smith (1994) examined the market for residential architecture using 131 row houses in the South End neighborhood of Boston. They point to the Vandell and Lane and Hough and Kratz articles, but in contrast to those, which use proxies for architectural quality, Moorehouse and Smith directly estimate the value of each architectural style and feature found in the South End. Although the authors make no claims on the 'quality' of the designs, they did find that the housing characteristics included in the study accounted for 88% of the price variance across the row houses. Most surprisingly, they found that specific architectural features were more highly valued when they differentiated one row house from its immediate neighbors. The conclusion of this paper is quite strong when taken in the context of the thesis at hand: although the exterior façade of a building is an externality, the users themselves benefit from differentiation afforded by the architecture. If the assumption that 'good' architecture is, at least in part, 'unique' architecture, then it must be that users would be willing to pay for a differentiation between projects.

Although these studies point to the fact that users are willing to pay for quality design, both the value of that quality and the cost of producing that quality are relative to other market forces. However, if value increases with increasing qualities of design, so should the cost of creating such design. In theory, as the cost of supplying good design must equal the value or the demand for good design, there must exist an 'optimal' level of design, beyond which the cost of producing the design is less than the demand, and below which the demand is greater than the cost.

3.0 CONSTRUCTION, COSTS AND GOVERNANCE OF DESIGN SERVICES: THE SUPPLY OF DESIGN

The three main factors affecting the design of a building are the cost construction, the cost of design, and the governance of the relationship between owner, designer and contractor. The contracting method and billing (costs) will determine the extent to which the designer is allowed to input the time necessary to create the best building possible. If the designer is contracted with a fixed fee, above which he/she will receive no additional pay, it should not be in their best economic interest to work beyond the exhaustion of this fixed fee. However, in the absence of a fixed fee, the owner is open to a greater risk, and must be compensated accordingly. It must be shown that the owner is compensated for the risks associated with increased design quality.

3.1 The Value of Planning and Design in Construction

Although few studies have been completed on the market for architectural design services and the value of ‘good’ design, a fair number of papers have been published on the value of planning within the construction and engineering fields. All point to an ‘optimal’ level of design to achieve the best results, such that any point below the optimal is too low, while any point above the optimal is no longer cost effective. Beyond the optimal, most times the increase in value does not necessarily increase proportionally with the increased spending on planning, while in other situations this increase can actually lead to deterioration in results due to over-planning. While not directly parallel to the study at hand in this thesis, lessons can be learned from these studies as they relate to the determination of an optimal level of planning and the calculation or quantification of 'quality' or 'best results.'

In most circumstances, increases in design quality increase the project budget. Taken to extremes, imagine a situation where the developer spent nothing on design: although he or she would have plenty left for construction, there would be no design, and therefore no resulting building.[7] Obviously the user demand for nothing is zero, and the return to the developer would also be zero. This is the situation when the developer 'passes' on a project. Nothing ventured, and nothing gained.

Now imagine a situation where the developer spent their entire budget on design. Although the design would most certainly be spectacular, there would be nothing left in the budget for construction, and thus, once

[7] This example assumes that a design is required to build a building, which is usually, although not always, the case.

again, there would be no resultant building. Although the developer would have already sunk the cost of design, there is still no building.

Again, the demand for nothing is zero and the income to the developer would still be zero. This is often the case when the developer “passes” on a project *after* the building has been designed.

In both cases no building is produced and, as a result, no income is generated from the building. Although for any market condition or segment, a certain level of design and building is demanded by users, the developer has nothing to offer due to the fact that either too little or too much was spent on design. These hypothetical situations suggest parabolic relationship between the independent level of design expenditures, and the dependant level of income generated that can be attributed specifically to the design. Although at both ends there is an income or return of zero, there must be a maximum return at the zenith of the parabolic function such that the derivative of income taken with respect to the design expenditure equals zero. A point on this function to the left of this optimal point suggests that the demand for quality design is greater than the developers expenditure on design, and through an increase in this expenditure, the developer can increase his or her final return. This situation could exist in a high-end market where the developer merely builds a non-descript building; although the market may absorb all units, the market would most likely be willing to pay for an additional level of design. Likewise, a point on this function to the right of the optimal level suggests that the developer has "over-spent" on design, and the increase in his or her return due to the design will actually be less than the cost of such design.

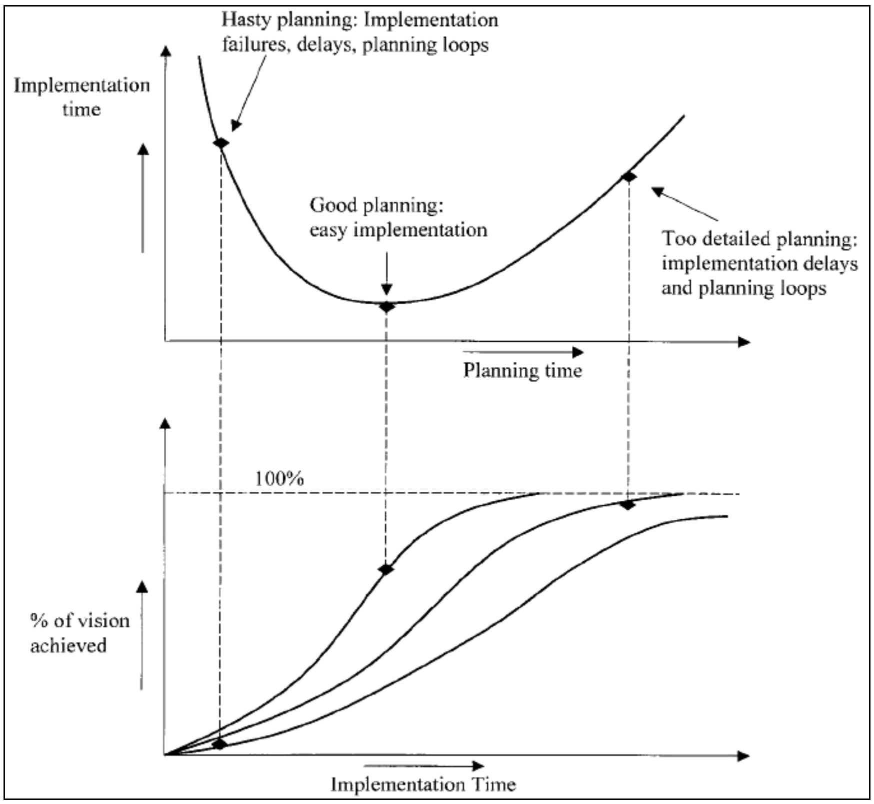

Figure 3.1.1: Diagram of Correct Planning

Source: Faniran, et al.

One of the earlier theories of 'optimal' planning is that of Firdman (1991), who proposed that the optimal level of planning results in "easy implementation" with the highest percent of vision achieved in the shortest amount of time. (Figure 3.1.1) Investing too little in planning results in "implementation failures, delays, and planning loops," while investing too heavily in planning results in a high percentage of vision achieved, but at the cost of increased implementation time as planners plan minute details of the project.

Thus, although the intended outcome is achieved through "over planning", the additional effort is wasted as the increase in "vision achieved" is far less than the additional planning time required.

In a similar theory, Neale and Neale (1989) proposed a relationship between project cost and project input (or planning) such that an increase of planning as a percentage of total construction costs does lower construction costs and direct project costs. (Figure 3.1.2) However, beyond a "saturation point," the decrease in construction costs are not offset by the increase in planning costs, thus resulting in an overall higher total project cost (direct construction and planning costs). Thus spending on planning beyond the saturation point (or optimal planning level) does nothing to reduce construction costs, but simply adds to the overhead and increases total project costs.

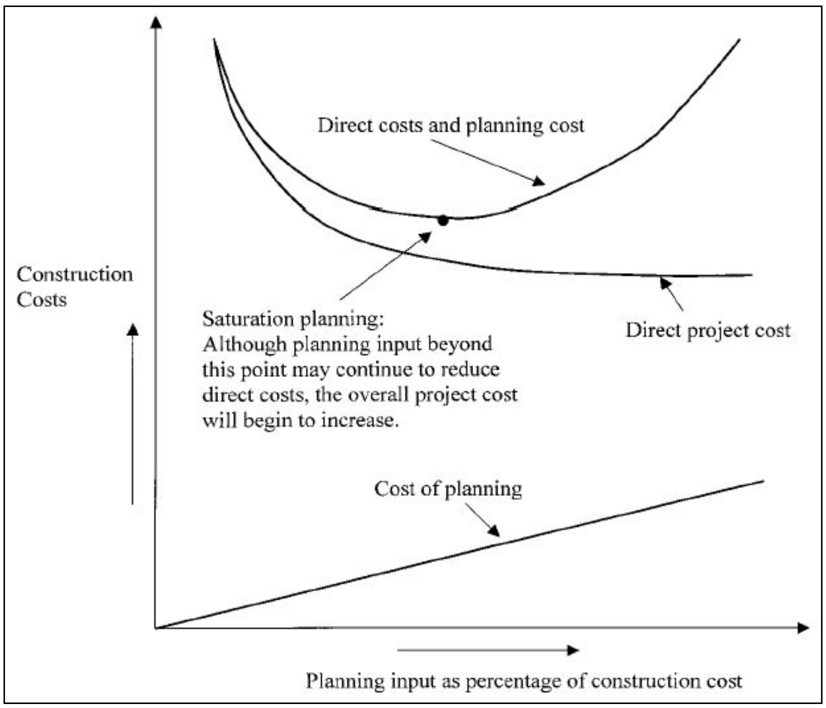

Figure 3.1.2: Proposed Relationship between Project Costs and Planning Input

Source: Faniran, et al.

As opposed to the more qualitative studies mentioned previously, Faniran, *et al.* (1999) attempted to quantify the probable value of optimal planning for construction projects. They began by discuss the two theories of construction project planning: findings from some research points to a linear and direct relationship between construction planning and construction performance, suggesting that performance can be improved by larger investments in planning. Other studies suggest a parabolic relationship between planning and performance, one where a lack of planning produces poor results, but over planning results in an increase in over-all project cost, thus also reducing results. It is this idea of an 'optimal' amount of construction planning on which the authors focus.

The study uses Ashely, *et al.*'s (1987) definition of project success, which the authors summarize as, "results much better than expected or normally observed in terms of cost, schedule, quality, safety and participant satisfaction." The authors also state that, due to a high degree of uncertainty inherent in the construction process, there are other factors that can contribute to a project's success or failure. Thus the authors focus their study on the increased or decreased chance of project success from an increase in planning. They hypothesize that the relationship between planning and chance of success will take one of four forms: the relationship will either be a positive or negative linear relationship or a positive or negative curvilinear relationship. (Figure 3.1.3)

The authors collected data via a questionnaire sent to eighty-five construction firms located in Australia, with a positive response rate of 62%. The construction firms were asked to pick one project and answer a set of questions. From their answers, variables for cost variance (percentage ratio of the final project cost to the original project cost) and time variance (percentage ratio of the final project duration to the original project duration) were determined, and the variables were fit with a normal curve to determine project performance. Projects in the first quartile of either variable were considered to be "above average," while those in the fourth quartile were deemed

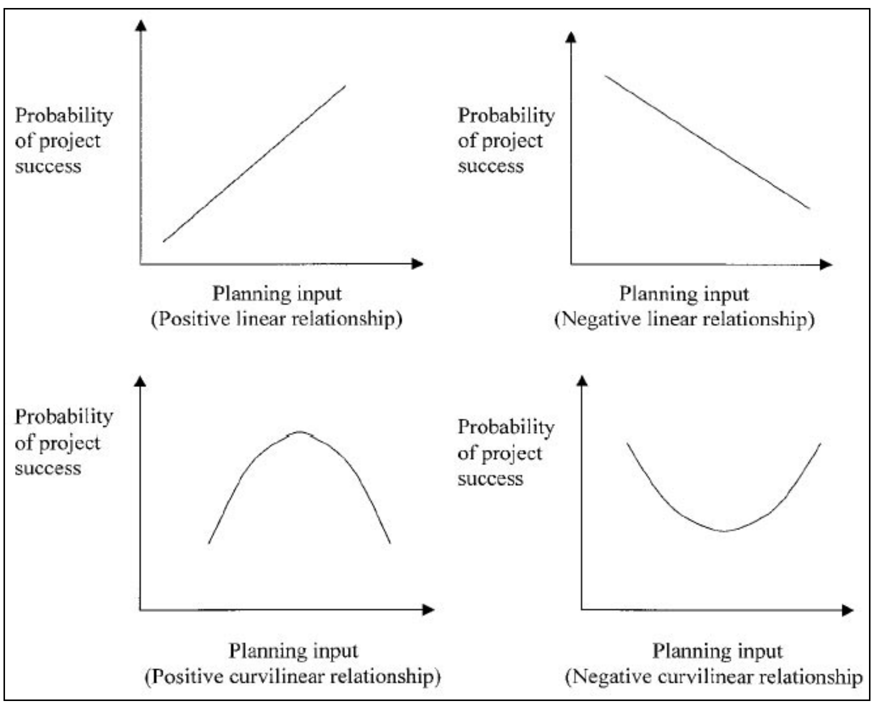

Figure 3.1.3: Possible Relationships between Project Success and Planning Input

Source: Faniran, et al.

"poor performance." Projects between the first and third quartile were considered "average."

Logistic and linear/curvilinear regression models were used to predict the chance of project success (or failure) given a set of independent variables. The results showed that increased planning efforts created an increased probability of good time performance as well as an increased probability of poor time performance, indicating increased planning has little effect on project time performance. The authors did find, however, a negative parabolic relationship between an increase in planning and the probability of increased cost performance. Their results seem to be in line with the theories of both Firdman and Neale and Neale, such that an increase in planning time increases the probability of good cost performance to a point; beyond this optimal point, increases in planning only serve to decrease positive cost performance. By determining the cutoff point where the probability of poor cost performance was 0.0%, the authors determined that, based on this data, the optimal planning input was .72% of the total project costs. (Figure 3.1.4) The authors finally conclude that, while the optimal planning value has inherent limitations, the results do demonstrate that there is exists an optimal planning level, beyond which the probability of poor cost performance begins to rise again, producing a result that is not cost-effective.

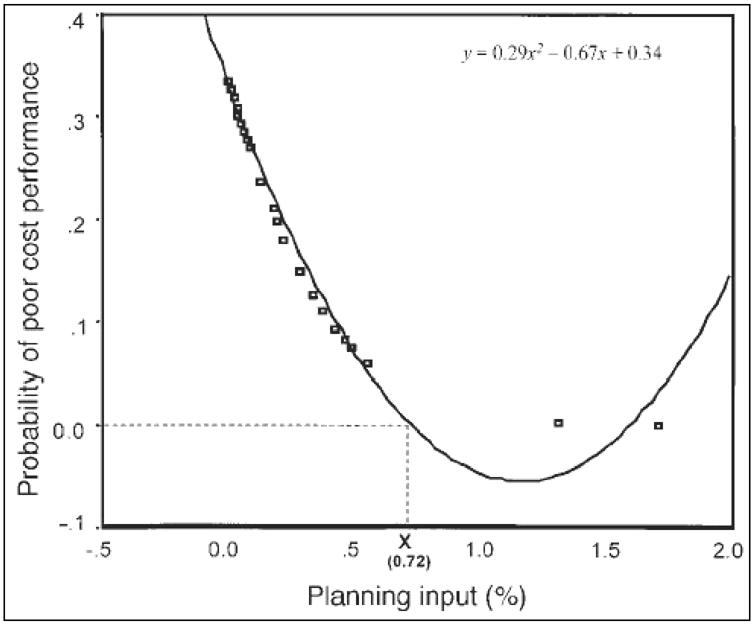

Figure 3.1.4: Probable Value of Optimal Planning Input

Source: Faniran et al.

That the chance of poor performance falls with each increase in construction planning, to a point before rising, the same could also be hypothesized for architectural or design planning. The developer or owner is willing to invest in an increase in construction planning because there exists an increased potential for a positive return. This positive return, or increased chance of such, must be directly correlated with an increase in planning spending; otherwise the spending would be wasted. According to studies referenced above, there is also a direct correlation between quality or unique design and return, such that an increase in quality of design leads to an increase in return in the form of rents or prices. The question is now: if quality design can increase the developer's chance of a positive return, what can increase their chances of obtaining quality design? Based on the theory of efficient markets, the answer should be simple: you pay for it.

3.2 The Cost of Design and Construction

There are various methods of contracting and paying for design services. The simplest of them is the flat fee, in which the architect "bids" on the design based on a clearly defined scope, and the developer or owner agrees to pay the architect that flat fee for the project design regardless of the actual cost to the architect. This arrangement, while lowering the risk of cost overruns to the developer, provides no incentive for the architect to produce a quality design. In fact, as the architect's return is inversely proportional to the number of hours spent on design, it actually behooves the architect to spend less time on working on a design and simply produce a building that requires little research or experimentation. A flat-fee contract is inherently non-innovative; to increase the chances for quality design, the developer must be willing to share some of the risk of cost over-runs by allowing the designer to spend the time required to complete a quality design.

Many studies have been made on the efficient or optimal allocation of design costs. Hurley and Touran's (2002) study on the cost structure and profitability of design firms is focused on engineering design contracts; however, much of their research is applicable to architectural design firms. The study was based on surveys of engineering firms conducted over 15 years, with the goal of quantifying the effect of overhead caps and non-reimbursables on firm profitability.

The authors first identify the four major elements of cost associated with engineering design contracts, which parallels those of the typical architectural design firm:

1. *Direct salary costs* are wages paid to employees for work performed on a specific project. Direct Salary costs are calculated as hours spent multiplied by the hourly wage. In a fixed fee contract, this number is estimated beforehand, and the architect receives this flat fee, regardless of what he/she pays out to their employees. In a 'cost plus' contract, the owner is billed for these hours as they accrue, plus a predetermined multiplier to cover overhead and indirect costs.

2. *Indirect salary-related costs* are wages or expenses paid to employees for work other than that performed on a specific project. Such items include: sick leave and holidays, paid vacation, payroll taxes, health insurance, and retirement benefits (e.g., 401k)

3. *Direct non-salary costs* are the expenses incurred for a specific project or contract. These expenses can include: travel and lodging, drawing reproduction, computer equipment, and subcontractor or outside consultant fees. Some contracts are negotiated so that these costs are billed to the owner, regardless of the fee structure, and are called 'reimbursables.' Conversely, if the contract does not allow for the reimbursement of direct non-salary costs, they are referred to as 'non-reimbursables.'[8]

4. *Indirect general and administrative* (G&A) are costs that, while not directly related to a specific project, are nonetheless necessary for conducting business as a whole. Such expenses are: administrative wages, office rent, non-project related computers, general marketing, insurance, registration and licenses, office

[8] It is generally the case that direct non-salary costs are reimbursable, except in the case of some public projects.

supplies, taxes, utility bills, interest expense, bad debt expense, and training and education.[9]

Both indirect salary-related costs and indirect G&A costs are usually expressed as percentage of direct salary costs, such that:

$$\text{overhead percentage} = \frac{\text{Indirect Costs}}{\text{Direct Salary Costs}} \tag{3.2.1}$$

Hurley and Touran suggest that, due to differing accounting principles, overhead rates between design firms can vary considerably. The authors also note that the average overhead percentage has risen considerably in the past 15 years, due mostly to the increased use of computers. Computers generally reduce the man-hours required to complete a project, thus reducing direct salary costs, but the indirect costs have risen substantially due to the greater cost incurred for computers, printers, etc. Thus without inclusion of overhead in the total

[9] Not all G&A expenses are reimbursable, and are individually negotiated in the contract. For example, some state agencies will not pay for bad debt expense.

amount billed to the client, design firms would become less and less profitable.

Usually the largest portion of the overhead rate is indirect labor such as administration and marketing. This indirect labor is usually measured in a utilization rate represented as a ratio between *project billable hours* and *total available hours*, or *billable direct salary costs* to *total payroll salary costs*. The relationship between the overhead rate (T) and the utilization rate (U) was presented by Norris (1987, 1990):

$$T = \frac{1.0 + R - U}{U} \tag{3.2.2}$$

…Where R is the expense ratio of both indirect salary-related expenses and G&A expenses to total payroll expenses. Thus even small variations in the utilization (and to a lesser extent the expense ratio) can have large effect on the overhead rate. Most design firms strive to obtain the highest possible utilization rates, but vacation and sick pay, marketing, and project delays, among other reasons, make it impossible to obtain a utilization rate of 100% for any employee. In fact, Hurley and Touran state that an employee who can bill 100% of their work hours to a client (such as a draftsperson or CAD operator), would still only have a utilization rate of around 86%. Senior staff utilization rates are usually between 40 and 50%, while partners or principles, who often spend more time marketing the firm (i.e., non-reimbursable) than working on specific projects, can have a utilization rate as low as 20 to 40%. As a whole, the typical design firm has a utilization rate of 0.6 to 0.7.

The utilization rate also plays an important part in the *overall earnings ratio* (net revenue to costs) of the firm. Again, Norris (1990) identified the equation:

$$C = \frac{MU}{R + 1.0} \tag{3.2.3}$$

…Where C is the *earnings ratio* and M is the *net fee multiplier*, or ratio of net project revenues to direct project labor.

Architecture firms rely heavily on the net fee multiplier, as the multiplier is simply the number by which all project related salaries must be multiplied to cover overhead, G&A, indirect salary expenses and profit.[10] This number can obviously vary from firm to firm, but acceptable ranges

[10] For example, if a firm has negotiated a multiplier of 3 for a specific project, a draftsperson earning $20 per hour would be 'billed out' to the client at $20 x 3 or $60.

are generally dictated by the market for architectural services. The less complex a project is, such as a suburban office building or a warehouse, the lower the multiplier will be. As overhead does not necessarily change from project to project, a lower multiplier for one job simply means lowered profit, al else being equal. Thus it is in the firm's best economical interest to enter into a contract with the highest possible multiplier, while it is in the client's best interest to negotiate the lowest possible multiplier. As fees vary from firm to firm, the owner or developer will choose the firm that provides the best service at the lowest price, in an effort to secure the highest possible chance of a positive or abnormally positive return. However, due to the economics of supply and demand, as demand for specific firms increase, these firms can begin to charge higher fees in the form of a higher multiplier. In a perfectly functioning market, as these fees increase, demand for architectural services should fall to the point where the opportunity cost of providing such services is exactly equal to the perceived chance of an increased return to the developer or owner. Thus what the developer is willing to pay the architect, as a percentage of the total building design, should be, in an efficient market, a reasonable proxy for the perceived quality of design. Anecdotally, this proxy makes sense, as buildings with little need for design, such as warehouses and self-storage facilities, usually cost less than 2% of the total budget to design. On the other hand, many buildings receive a great benefit from quality or unique design, such as a museum or a concert hall. Design fees for these types of buildings can be as much as 10 to 20% of the total construction cost.

It is not, however, only the architectural fees themselves that affect the total cost of the building design, but the contracting method chosen between architect, owner, and contractor. Although little research has been done on architectural contracts, extensive study has been completed on construction contracting methods. As owner-architect contracts are very similar to owner-contractor contracts, an analysis of literature concerning the latter will be relevant to the study at hand.

3.3 Contractual Governance of Design and Construction

In his 1994 study, Gordon examines the “compatibility of various construction contracting methods with certain types of owners.” (196) Although he breaks the contracts into two main groups, fixed price (lump sum, unit price, or guaranteed maximum price) and reimbursable (cost plus or a fixed fee), Gordon first defines the construction contracting method as having four parts:

1. *Scope. The portion of the project tasks – design, construction, and finance, that is assigned to the contractor* [or architect].

2. *Organization. The business entity with whom the owner holds a construction contract, such as a general contactor or a construction manager.*

3. *Contract. The agreement of how the owner will pay the contractor for work performed, such as a lump-sum or cost-plus payment. These can be divided into two major groups of fixed price and reimbursable contacts.*

4. *Award. The method used to select the contractor and/or the price, such as competitive bidding or negotiation. (196-197)*

While Gordon states that the scope is a “byproduct of the organization selection,” he points to the importance of the organization, contract and award as the variables that should be analyzed within the context of the project.

The “traditional method,” is one in which the contractor is responsible for the construction of the project only, while the designer is responsible for the design of the project, as well as for monitoring the construction process. It is within this method that a fixed or ‘lump sum’ price is determined before the start of construction. The advantages of this method are that the scope and responsibilities of the parties are clearly definable, and it allows the owner control over the design. This type of contract also makes the price, which is arrived at through competitive bidding, known *before* the start of construction. Due to the bidding nature of the price, the owner receives the lowest possible price from the best possible contractor, while the contractor is guaranteed a lump sum, and is therefore encouraged to manage the project to the best of his/her ability.

This method, as Gordon states, is “fine in many cases where the project is clearly definable, well and completely designed, not necessary to complete in less time than the standard process will take, and is unlikely to change during construction.” However, Gordon suggests that, as projects become more complex, the traditional contracting method becomes less effective. Because the lump sum price requires a complete set of construction documents, it is not until the end of the design phase that the contractor is selected. This requires the architect to be ‘all-knowing’ concerning design *and* construction, while at the same time, "liability concerns seldom allow them to gain construction expertise." As the building becomes more complex, the architect becomes less capable of producing a complete set of construction documents, and thus the contractor is not able to determine an accurate lump sum price. This lump sum price creates what Gordon calls an "adversarial relationship and lack of teamwork," between the designer and contractor, as the fixed-price "zero-sum" contract provides no incentive for either to cooperate. This lack of cooperation creates inefficiencies and a resistance to innovation. In fact, it is estimated that 30% of a project's cost is due to failures in the process of design, construction, and management. (Brown and Beaton, 1999) Puddicombe (1997) attributes this lack of integration to the differing goals and responsibilities of both parties. He suggests a social psychological approach to integration, and, like Gordon, the use of "non-traditional" methods of contracting.

After an analysis of the 'traditional method' (General Contractor, fixed price) of contracting and its flaws and limitations, Gordon describes the non-traditional contracting methods, and how they are affected by the various drivers of a project:

1. *General Contractor, Reimbursable* (GC-R) are similar to General Contactor, Fixed Price (GC-FP) contracts, except the General

Contractor is reimbursed for all expenses, plus a margin for profit. This contract most often takes the form of 'cost-plus,' but could also be a unit price contract (set cost per unit of each item), or Guaranteed Maximum Price (GMP) in which the contactor is reimbursed (cost-plus), up to a previously agreed upon 'cap,' beyond which the owner cannot be charged for any additional costs.

2. *Construction Manger* (CM) is an entity that is neither the contractor nor the owner, but who oversees the construction process and acts as a consultant to the owner.

3. *Multiple Primes* (MP) is a situation where multiple contractors of differing trades have contracts directly with the owner. This is in contrast to a GC-type contract, where the owner only has a contact with one contractor (GC), and the various trades are subcontractors to the GC. The MP-type contract requires much more involvement and sophistication on the part of the owner.

4. *Design-Build, Fixed Price* (DB-FP) is a contract between an owner and a single entity that will both design and build the project, all for a fixed fee.

5. *Design-Build, Reimbursable* (DB-R) is similar to above, but with a cost-plus or GMP structure.

6. *Turnkey, Fixed Price* (T-FP) is similar to design/build, except the single entity also provides financing for the project. The owner simply pays for the building at completion.

7. *Turnkey, Reimbursable (T-R)* is similar to above, but with a cost-plus or GMP structure.

8. *Build-Operate-Transfer* (BOT) is similar to a turnkey situation, except the single entity responsible for design, construction, and financing also operates the building for a period of time before turning over possession to the new owner.

Gordon also enumerates the three "drivers" affecting the organization selection: project drivers, owner drivers, and market drivers. Although owner drivers, such as the owner's construction sophistication, and market drivers, such as the package size of the project, are important in the choice of a contract, it is the project drivers that most affect the contract as it relates to the design. The project drivers are listed as time constraints, flexibility needs, preconstruction service needs, financial constraints, and design process interaction. It is the latter that becomes the most important driver in the context of this thesis:

> *Owners must assess how much interaction they want to have with the designers during the design of the project. This interaction is normally important to owners if the design is intended to be highly creative, the appearance is critical and/or its ability to serve a function is essential. With an independent designer, as used with a general contactor, a CM* [construction manager]*, or multiple primes, the owner has complete interaction and control over the design.* (199)

When interaction between designer, owner, and contractor is important, as is the case in creative or unique buildings, Gordon suggests avoiding Design/Build fixed price contracts, Turnkey fixed price, and Build Operate Transfer contracts. (Figure 3.3.1) Although design interaction is an important part of creating a "good" building, additional flexibility (i.e. the ability to make changes any point in the design or construction of the project) and pre-construction advice (i.e. relying on the expertise of the contactor *during* design) are also important. Together, all three allow for the creation of the most unique, creative building possible. Thus this author has expanded Gordon's chart to highlight these drivers, and the contracts that satisfy *all three* drivers. (Figure 3.3.1) From this analysis, it is clear that fixed-price contacts are not advisable, nor are build-operate-transfer contracts. Fixed price contracts are not advisable as they provide no incentive for the contractor to work economically, nor do they provide an incentive for architects to spend the extra time needed to design 'good' buildings. The risk of cost over-runs rests solely with the contractor and the designer, as unforeseen changes cost the owner nothing.

Drivers	GC-FP	**GC-R**	**CM**	MP	DB-FP	**DB-R**	T-FP	**T-R**	BOT
Fastrack Schedule		■	■	■	■	■	■	■	■
Sequential Schedule	■	■	■	■	■	■	■	■	■
More Flexibility		■	■	■		■		■	
Less Flexibility	■	■	■	■	■	■	■	■	■
Pre-Construction Advice Needed		■	■		■	■	■	■	■
No Pre-Construction Advice Needed	■	■	■	■	■	■	■	■	■
Design Interaction	■	■	■	■		■		■	
Less Design Interaction	■	■	■	■	■	■	■	■	■
Construction Financing Needed							■	■	■
Permanent Financing Needed									■
Owner Financing	■	■	■	■	■	■			

Figure 3.3.1: Compatibility of Various Contracting Methods with Project Goals and Requirements

Source: Adapted from Gordon

Therefore, the advisable contract method for building good buildings is one where the architect or contractor are reimbursed for their time multiplied by a previously agreed-upon multiplier. However, as a reimbursable contract shifts a greater portion of the design and construction risk to the owner, his or her return should be higher to compensate them for the increased risk. Thus well designed and constructed buildings, especially ones built under a reimbursable contracting method, should show a greater return than a building of more questionable design or construction quality. Otherwise there is no incentive for the developer to expose himself or herself to the increased costs and risks associated with quality design.

4.0 CASE REVIEWS: BOSTON MULTIFAMILY HOUSING

Developers in Boston have recently become aware of the power of design. Boston's housing boom that began in the mid-Nineties was followed closely by a construction boom of new multifamily units. As demand increased and more and more developers attempted to cash in on the boom, it became increasingly important for projects to differentiate themselves through design. This has become especially true as sites with unique locations or outstanding views have become less and less common, for it is now suddenly left to the architect to create the uniqueness of the property. Uniquely designed buildings seem to enjoy not only a price premium, but faster absorption rates, and reduced approval time, all of which equate to an increased return to the developer.

This section of the thesis looks at some highly successful recent projects in the Boston area. As both developers and architects tend to be cautious about divulging budgets, line items and returns, only publicly available information has been used in an attempt to determine a link between positive press (and thus pointing to unique and quality design) with increased per square foot condo sales prices (representing a capitalization of design expenditures into the sales price). While it is impossible to determine the extent to which good design contributed to the success of these projects without quantitative study, an important theme arises from this cursory review of successful, well-designed projects: users respond to design and are willing to pay for it.

This section will finally conclude with a discussion of the views of local architects and developers concerning the value of quality design on residential projects in Boston.

4.1 Atelier 505 at the Boston Center for the Arts

Project Facts:

• Developer	The Druker Company, Ltd.
• Design Architect	Machado and Silvetti Associates
• Managing Architect of Record	ADD, Inc.
• Contractor	Turner Construction
• Completed	June, 2004
• Program	400,000 gross square feet 50,624 square foot lot • 103 market-rate condominiums • 15,000 sq. ft. of retail space • 5,000 a sq. ft. restaurant • 375 vehicle parking spaces • 350 seat proscenium theatre • 200 seat “black box” theatre
• Location	Boston, Massachusetts (South End Neighborhood)
• Total Project Cost	$100 Million

Figure 4.1.1: Façade from Tremont Street

Source: Chaloner Associates

In 1995, Boston's mayor, Thomas Menino, established a task force to determine guidelines for the development of a predominant yet vacant brownfield lot in the South End neighborhood of Boston. The mayor and the BRA (Boston Redevelopment Authority, the owners of the parcel) sought to guarantee a project that would create a "*worthy architectural presence*," while at the same time expanding the existing cultural facilities of the BCA (Boston Center for the Arts). The project had to be compatible with the community interests of local residents and nearby businesses, along with the city of Boston as a whole. According to Boston Homes, "Anything developed on the site would serve not only as a landmark to the South End but as a gateway to the Back Bay as well." (Jackson, 2004)

Although five developers responded to the city's request for proposals, the president of Druker himself admits that it was the design of the building that won the project for his company. The proposal's design acknowledged the South End's 18th century architecture through use of brick and building forms, while at the same time created a thoroughly modern building that spoke of the South End’s future. Druker’s proposal was unique in that all other developers proposed historicist copies of the existing Victorian row houses. "I think our building has an opportunity to become the real focal point of what the South End is about, which is people living there, shopping there and the arts," said Druker. (Jackson, 2004)

Druker hired the internationally renowned Boston firm of Machado and Silvetti to design the project, along with the Cambridge-based firm of ADD, Inc. Frederick Kramer, AIA, Principal at ADD, Inc. said, "Atelier/505 is a sophisticated design solution to a very challenging site. It's [*sic*] varied program elements accommodate a number of needs from over 100 condominiums to the creation of first-class performance space for the Boston Center for the Arts and The Huntington Theater, active retail uses at street level, public open space, and below grade secure parking for residents and others visiting the South End area. The complex design and construction issues were

Figure 4.1.2: View of Model from Tremont Street

Source: high-profile.com

tackled head-on in a highly collaborative fashion by an exceptional group of architects, interior designers, engineers, and construction professionals resulting in what will be yet again another landmark project for The Druker Company and a welcome addition to the developing fabric of the City of Boston. "

Machado and Silvetti tackled the design not only as a discreet piece of architecture, but with an understanding of the importance the building would have on the urban fabric of the neighborhood:

Figure 4.1.3: Tower Detail

Source: Machado and Silvetti Architects

The new building treats the entire city block as a conceptual unit divided into many buildings orchestrated relative to one another with the BCA's Cyclorama dome as the architectural centerpiece. The new building mass steps back from the face of the Cyclorama along Tremont Street, exposing the building's copper dome to the street. This stepping back also creates a triangular public plaza, animated by landscaping, paving patterns, café seating, shopfronts, display windows, and lobby entrances. This plaza is a simple stage-like surface for activities that spills *from the building. The architecture reinforces this activity by its mix of program and by its activation of the street, with multiple entrances to retail, housing, and public functions. The new construction is designed to read as several volumes, rather than as a single monolithic building, in order to allow for transitions in scale and to echo the nature of the South End fabric.*

The building was very well received by the press and the public alike. Despite a glut of high-end condos that became available at the same time as Atelier's, the units were 90% sold before construction was even half complete, 18 months ahead of schedule. The condo presales were so successful that, despite a flagging economy, Druker was able to raise prices and sell out the entire building before construction was complete. (Witkowski, 2004) Although the building offered many amenities, such as parking and a 24-hour concierge, the condo sales at Atelier broke many records, selling units for more than

Figure 4.1.4: Aerial View of Model

Source: high-profile.com

$1,000 a square foot and penthouse units for more than $3.1 million. The design architects name was used extensively in marketing literature, and some people actually bought units specifically because of the designer. Most buyers, even if they did not recognize the name of the architects involved, were impressed by the design, and chose to purchase there because of it. Although its prominent location and a long list of amenities contributed much to the success of the building, it is clear that the outstanding architecture and urban design was a large part of that success.

Figure 4.1.5: Tower Façade

Source: Machado and Silvetti Architects

4.2 The Residences at the Ritz-Carlton Towers

Project Facts:

• Developer	Millennium Partners
• Design Architect	Gary Edward Handel + Associates
• Managing Architect of Record	CBT/Childs Bertman and Tseckares
• Completed	May, 2001
• Program	1.8 million gross square feet • 309 market-rate condominiums • 191 room five star hotel • 63 rental and extended stay units • 19 screen movie theater • 100,000 sq.ft. health club • 50,000 sq.ft. retail space • Parking garage
• Location	Boston, Massachusetts (Midtown)
• Total Project Cost	$515 Million

Completed in 2002, the two towers that make up the Ritz-Carlton complex are as “un-Boston” as they could be. Located across from the Boston Commons, the United State’s oldest public park, with a view of the State House and Beacon Hill, the towers are thoroughly modern in their massing, form and materials. In contrast to the simple, puritan brick structures of Beacon Hill, the tower complex is a collection of stainless steel, glass, granite, and metal panels. In spite of, or perhaps because of, the fact that the buildings are not in the ‘typical’ Boston style, all 309 market rate units sold quickly and for a considerable premium.


Figure 4.2.1: View of Towers from Boston Commons

Source: Boston.com

The project has not only been a success for the owners, but for the surrounding community as well. Located in the former “Combat Zone,” or red-light district, of Boston, the area is now a hot-bed of development. A near-by historic opera building has recently been restored, along with countless other new developments. Susan Hannon, a deputy director at the Boston Redevelopment Authority, said that the Ritz-Carlton “really was a catalyst" for downtown improvement. In fact, the project was awarded a Charter Awards from the Congress of New Urbanism in 2002. The award, founded in 2001 "to promote virtues such as 'coherent regional planning, walk-able neighborhoods, and attractive, accommodating civic spaces,'" was given to the Ritz-Carlton Towers and 17 other projects out of more than 200 entries. Christopher Jeffries, co-founder and principal of Millennium Partners, recognizes the value the unique architecture played in the success of the project:

Figure 4.2.2: Aerial View of Towers

Source: CBT Architects

> *"It's great to receive professional recognition for your projects and CNU's Charter Award feels especially gratifying, since the Congress embodies the highest ideals of contemporary urban planning and design. The jury represents the best thinking on modern urbanism," said Jeffries, He added thanks to architect Gary Handel, Blake*

Figure 4.2.3: Façade at Street Level

Source: freefoto.com

Middleton and the entire design team for representing "the perfect design partnership in executing our development model with particular sensitivity to quality of life issues in an urban setting."

"Our current projects - in Boston, New York, Washington, San Francisco, Miami - are all similarly aimed to advance downtown, neighborhood lifestyle and commerce at the highest level through a mixed-use combination of the best lodging, residences, entertainment, retail, dining and recreational activity," Mr. Jeffries said. "Although this award singled out our work in Boston, it deserves to be shared with all of our ventures. Certainly the Charter Award will help keep our eyes on the prize as we continue to practice our own brand of new urbanism around the country." (__,Millennium Partners Press Relesase,1)

4.3 Laconia Lofts

Project Facts:

• Developer	Laconia Associates (Jack McLaughlin)
• Design Architect	Hacin + Associates
• Managing Architect of Record	Conyngham Associates
• Contractor	Suffolk Construction
• Completed	November, 1999
• Program	160,000 gross square feet • 99 loft-style condominiums • 6 ground floor commercial condominiums • 79-car underground parking
• Location	Boston, Massachusetts (South End Neighborhood)
• Total Project Cost	$18 Million

Figure 4.3.1: View from Washington Street

Source: Hacin + Associates

Completed near the end of 1999, the Laconia Lofts building is a 99-unit, new construction loft building in Boston's South End. The award-winning architect, David Hacin, says the building is meant to "evoke the old New England mill buildings with their strong brick presence and horizontal bands of windows interrupted by vertical circulation elements." The project met its low-income quota by selling 45 units to qualified artists at half the approximately $200-per-square-foot price of the other units. The architect points out that while traditional low-income "set asides" demanded by most cities discourage wealthier buyers; those who want a loft see the presence of “creative types” as an added attraction. Ultimately the project sold very well, considering it was the first building of its kind on Washington Street, an old section of Boston that was, until Laconia spurred development, a rather dangerous and foreboding area of the city.

Figure 4.3.2: Building Penthouse

Source: Hacin + Associates

4.4 Differing Views on the Value Design

The supply within the market for good buildings responds to user demand; an increase in demand will be followed by a change in supply and, at least in the short-run, an increase in price. However, in order for the developer to supply “more” quality architecture, he must demand more input from architects. As the supply curve for the inputs of development, including design, is upward sloping, as the “amount” of design quality supplied increases, the price should also increase. Simplistically stated, in a competitive market, a better building should cost more to design, more to produce, and more to buy (or rent).[11] The developer’s return is based on the user’s willingness to pay within the market for buildings, so if demand rises, and the developer’s return increases, he or she should demand more quality architecture. While it is impossible to predict the design quality of any building before it has been designed, developers can increase their chances of obtaining a good design by hiring architects and planners with a reputation for quality design. These are usually architects that have won awards or have been published in national design magazines, and they have usually built a successful building of a similar type before.[12]

[11] At least in the short run.

[12] Although there must always be a first time. Atelier 505 was actually the first multifamily residence designed by Machado and Silvetti. The firm does, however, have much experience in institutional residence halls such as the Weiss College dormitory at Rice University.

Thus as the user's demand for good buildings rises, the developer's demand for good architects should rise as well. It would be expected that an architect with a proven record of good design would increase the developer's chance of providing a good building, and would thus be able to charge higher rates as a result of the increased demand for his or her services, and yet that is not always the case. "My experience is that bad and good architects end up charging more or less the same fees," says an employee of the Boston Redevelopment Authority.

Ironically, 'good' architects can actually end up making less than 'bad' architects.[13] Most projects are fixed fee, which, in the absence of other incentives such as increased reputation, is a poor contributor to quality design. However, fixed fees are the norm because there are a large number of architects competing for the work of only a small number of sophisticated, business savvy developers. In most private, commercial situations, it is the developer that has the most bargaining power, which drives down architectural fees. Fees are eventually driven so low that

[13] At least in the short run on a per-project basis, assuming the same fixed fee for the same project.

architects will take any job simply to stay afloat. An architect, however, is always thinking about his or her reputation, for there are both financial and psychological benefits to a good reputation. Thus with a fixed fee contract, the architect who cares more about his/her reputation than the bottom line, and wants to create a good building at any cost, will continue to work even if it means the fee has 'run out.' The 'bad' architect, who views the design of a building merely as a business opportunity rather than an artistic and creative endeavor, will actually stop work on a project before the fee runs out, thus earning money while the good architect looses money.[14]

Thus the value of good architecture differs between individual stakeholders. For some developers, there is a psychological benefit to creating good buildings, while for others there is merely a financial benefit. It is, however, the developers who view the benefit of good architecture as both financial and psychological that will strive to create

[14] This, of course, assumes the architects are of equal efficiency and reach the same level of design at the same time. In this example, the 'good' architect continues to work to create the best product, while the 'bad' architect ceases production.

the best buildings. It is the developers, who understand both the short-term financial returns and the long-term psychological returns to good design that will be willing to invest the most.

Likewise architects have differing views of the value of design. For some, the psychological benefits such as reputation and awards are greater than the financial benefits. These are the architects who will strive to create the greatest buildings at any cost, possibly losing money along the way. However, as long as they can stay in business, they will continue to create quality architecture as demanded by developers, the users, and the community.

5.0 CONCLUSION

In examining the market functions of the users, developers, and suppliers of good design, this thesis has shown the effect of good design on real estate property values. What's more, good design has shown to provide value in multiple ways: first, good design can actually command a price premium on a project. If the cost of the design is less than the price premium gained, good design can actually have a positive effect on the financial returns of the building.

Price effects are not the only benefit to good design; there are indirect benefits as well. Good design has shown to increase the visibility of a project, providing a 'cache' to users and owners. Good design has also been used as a marketing device, and can increase absorption and decrease vacancy. Finally, good design has been shown to have a positive effect on surrounding property values and bystanders. Good design can be a catalyst for economic development, and in turn make people feel safer in their communities. Taken as a whole, the returns to good design are immense.

What is unclear is the cost of providing good design. Anecdotal evidence suggests that the some architects can actually charge a premium for their design services, while others, in the face of increased competition, cannot. That premium, however, is based on both the current market conditions for architectural services, as well as the relative name-recognition of the architect amongst the general public.[15] Well-known architects and designers like Philippe Starck, Frank Gehry, or Richard Meier can charge a much higher premium than the average local architect.

It seems that, to a point, this premium is capitalized into the value of the property. However, literature reviewed in this thesis suggests an "optimal" level of planning such that either an increased or decreased spending on design would result in a decreased overall return. This, however, can only be shown through qualitative analysis.

[15] Name recognition among developers and the design community seems to have little effect on the fees architects are able to charge. Architects must be known by the general public to truly command a generous price premium for their services.

5.1 Qualitative Study Proposal: Determining Optimal Design Values

As stated previously, the market for architectural services is unclear. Some practitioners view the service as a commodity; one architect's service is identical to another's. This can often be the case in simple, standard buildings such as warehouses or self-storage units. The name-recognition or cache of the architect plays no role in the value of the property, and so one would expect the market value of such services to be driven to the marginal cost of providing the service, and would ultimately become a zero-sum game for architects.

However, some projects do rely on the name recognition of the architect for more effective marketing, faster lease-up and absorption, and an actual price premium on each unit sold or leased. This fact points to a market for architectural services that is differentiated such that the 'better' providers are able to charge more than the 'less qualified' providers.

What is also true from anecdotal evidence is that better buildings take longer to design. This is the case due to the increased time required to study alternative designs, increased reliance on consultants, and an increased use of staff. Ultimately good design is not free, but there appears to be a positive return that is correlated with an increased spending of time and/or money on achieving good design.

Thus there appear to be two *potential* proxies for good design: money, or dollars spent on design, and time, or hours spent on design. The latter assumes that additional man-hours spent on design are necessary to create high quality architecture. The former assumes an efficient, fair market for architectural services such that better architects get paid more, and thus hiring a better architect, and (potentially) obtaining a better building, should cost a larger percentage of the total project budget than would a lesser building designed by a lesser architect. And while this is not always the case, as discussed above, there is always a cost associated with design, and there should exist an optimal level of spending for any given project.

The former proxy, time, is an adequate proxy due to the fact that better buildings take longer to design. Good building designs go through much iteration, as no architect can design the 'perfect' building on the first try. As more hours are spent refining and experimenting with the design, the potential for achieving a high-quality design rises. The flaw of this proxy is that it assumes all architects are of equal talent and skill, and thus the only variable of quality is time spent on design. This, however, is not always the case, as more talented architects can design a high-quality building in a shorter time frame than can a less talent architect. Nevertheless, many developers view architectural services as a commodity rather than differentiated services, and so, from the perspective of the developer, time is the only variable. This proxy is a particularly strong choice in cases of fixed fee contracts; money spent on design is no longer a variable, leaving time as the only variable to affect design. As stated before, even in the face of a fixed fee contract, the better architect usually values his/her (long-term) reputation over (short-term) revenue, and will therefore spend more time on design. Finally, data for this proxy is easy to collect as most architects carefully record man-hours spent on each project, and for each phase of the project. Through regression analysis of time spent on design versus sales price, optimal man-hours could be determined for any time of project, and for any phase of design.

The latter proxy assumes that the developer is willing to pay for the potential of obtaining a better design, and that better architects cost more. It does not necessarily assume that the better architect spends more time on design, which eliminates the potential error of the previous proxy where good architects might take less time to arrive at a quality design. This proxy, taken from the view of the owner, is an accurate picture of the development process; the developer is only concerned with the quality of the design and cost of obtaining such quality.

Ultimately the best proxy is a combination of both time and money. Dollars spent per hour and number of hours used as independent variables will eliminate a majority of flaws previously mentioned, while continuing to convey all the proxy characteristics of good design. This variable is particularly strong under cost-plus or variable contracts, as the dollar figure (money) accounts for the economic value of the architect and any aspect of quality that can be attributed directly to the architect, and the hour figure (time) accounts for that aspect of quality that can be attributed to time spent on design. In order to compare design costs of buildings against each other, it is necessary to determine the economic value of the design spending, not the design spending itself. As stated previously, architects are not always paid for the value that they produce, especially in fixed price contracts. However, the economic value (V) of the design is value of one hour under a fixed price contract, times the number of man-hours spent on the job:

$$V = \left(\frac{F}{h}\right) \times H \qquad (5.1.1)$$

… Where V is the total economic value of the design, F is the total price fee (fixed or variable) to the architect, h is the estimated number of hours from which the fee is determined, and H is the actual number of man-hours spent on the design. This equation allows any contract to be calculated as a cost-plus figure, regardless of the actual negotiated structure. In the case of a cost-plus contract, h and H would be equal, as the architect's fee is based on the actual number of hours worked. Thus in a cost-plus or variable contract structure, the fee paid to the architect is equal to the economic value of the design. In the case of a fixed fee contract, where the economic value of the design is not necessarily equal to the fee, F/h is the contracted hourly rate, H is the actual number of hours spent on design (which could be more or less than h) and V is the economic value.

The economic value V of the design can then be regressed as an independent variable against multifamily housing sales to determine an optimal *economic* spending on design.[16] Single family units will be disregarded; the theory being that a home-owner who builds their own house can determine their own optimal level of design *before* committing to a project. For multi-family projects, the hypothesis is that the value of design is concave; a developer who spends nothing on design (0% of

[16] Any property or type or tenure choice, such as commercial leases or residential rents, would provide a valid independent variable.

total construction costs) or the entire budget on design (100%) will obviously have no building, and thus make nothing in return. Ultimately, this future study hopes to determine the optimal level of design fees, below which a developer could make more money by increasing design costs, and above which a developer is losing money and should decrease the quality of design.

Through a hedonic regression of Boston area multifamily condo sales as compared to each unit's pro-rata share of total (economic) design costs as a percentage of total (actual) project costs, it is the hypothesis of this proposed study that the outcome will be similar to the aforementioned optimal planning studies. As mentioned previously, this total design cost should be parabolic in nature, and by taking the derivative of this total design cost with respect to price, an 'optimal' economic design cost (as a percentage of total development costs) can be determined.

The data set for the left-hand side of the equation, or dependant variable, is price. Data for condo sales in Massachusetts is publicly available, and therefore only involves identifying the projects to be studied and their addresses. This data set will also include some of the independent variables against which the price variable will be regressed, such as time and location. It is necessary to control for all other amenities that are not affected by design costs, such as distance to public transportation or distance from parks or the CBD, which can easily be determined by mapping each project using GIS. It is also crucial to choose projects that fall within a similar set of market conditions, either at the top or the bottom of the market, or to include a dummy variable for each to control for the possibility that good design is not capitalized, but only a means of differentiation during adverse or positive market conditions. This variable can be determined by graphing the project's completion date on an accurate graph of historic house prices.

Finally, the required data for the right-hand side of the equation is the proxy for quality design: the *economic value* of the project. For privately funded projects, this figure is not publicly available, and would be necessary to obtain from developers or architects. It will also be necessary to determine the total development budget and total square footage for each project.

Ultimately this data will be collected via survey. After identifying projects that fall within the confines of the study (multifamily Boston area developments within one time frame or market condition), a survey will be conducted of both developers and architects of each project. Economic values from completed surveys will then be added to sales price data and regressed to determine optimal soft cost expenditure for the Boston area.

In conclusion, this figure will only determine the optimal economic level of spending on design based on the design's *private* value; it will not determine the socially optimal level of design spending because it does not take into account the value of design to parties other than the end users. In a perfectly functioning market devoid of any externalities, the amount of design demanded by developers would be the economic value of the design, and the architect would be compensated based on his or her cost of providing this design. This, however, may never be the case; as long as architects continue to focus on design and developers continue to focus on business, there will always be an imbalance between two. Developers will continue to negotiate for fixed fee contracts, and architects will continue to accept them in the face of a competitive market. Nevertheless, by understanding the value of design, and the economically and socially optimal level, developers and architects might move a bit closer to the center, with the architect understanding the costs and limitations of design, and the developer understanding its immense value.

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