Gated Communities and House Prices: Suburban Change in Southern California, 1980–2008

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Abstract

Housing prices being one factor thought to contribute to segregation patterns, this paper aims at differentiating gated communities from non-gated communities in terms of change in property values. To what extent do gated communities contribute to price filtering of residents, accentuated by patterns of price differentiation favoring gated communities in the long run?

The paper provides an analysis of the territorial nature of gated communities and how the private urban governance realm theoretically sustains the hypothesis of better protection of property values in gated communities. In order to identify price patterns across time, we elaborate a spatial analysis of values (*Price Distance Index*), identifying gated communities with real-estate listings in 2008, matched with historical data at the normalized census tract level from Census 1980, 1990 and 2000, in the greater Los Angeles region.

We conclude that gated communities are very diverse in kind. The wealthier the area, the more they contribute to fuel price growth, especially in the most desired locations in the region. Furthermore, a dual behavior emerges in areas with an over-representation of gated communities. On the one hand, GCs participate in local contexts that introduce greater heterogeneity and instability in price patterns, and by doing so contribute to a local increase of price inequality that destabilizes the price patterns at neighborhood level. On the other hand, GCs spread in contexts that show a very strong stability, in terms of producing price homogeneity at the local level.

Key words: private urban governance, suburbs, gated communities, spatial analysis, property prices, segregation

Résumé

La sélection des résidents d'un quartier par le prix constituant un facteur fondamental de la ségrégation, cet article vise à analyser la manière dont les gated communities se différentient des autres lotissements non enclos, en termes d'évolution des valeurs immobilières. Les gated

communities constituant avant tout des lotissements comme les autres, à la différence près que leur accès est fermé et contrôlé, notre étude porte sur la manière dont ces lotissements fermés se différentient des autres lotissements en termes d'appréciation ou de dépréciation relative des biens immobiliers ; et ce faisant dans quelle mesure elle contribuent à une sélection sociale des résidents accentuée par des logiques différentielles de production des prix immobiliers sur le temps long.

Dans une perspective expérimentale à l'échelon local dans la région de Los Angeles, cet article vise donc, d'une part, à explorer la nature territoriale des gated communities, en particulier la manière dont leur appartenance au genre plus général des lotissements en copropriété (*Common Interest Development*) permet de structurer la réflexion sur la manière dont elles peuvent générer une plus-value immobilière par rapport aux lotissements non-enclos. L'analyse porte d'autre part - avec les outils de l'analyse spatiale (indice de discontinuité des prix immobiliers) dans les zones ou les lotissements planifiés (fermés ou non) sont surreprésentés (entre 1980 et 2008). A partir de données immobilières, nous identifions les gated communities et les comparons aux données fournies au niveau des Census Tract du recensement en 1980, 1990 et 2000, afin d'analyser les types de trajectoires temporelles des prix immobiliers.

Les résultats montrent que les gated communities sont d'une part très hétérogènes, et contribuent globalement à soutenir la hausse des marchés immobiliers, en particulier dans les zones les plus attractives. De plus, les gated communities introduisent localement une plus grande hétérogénéité et instabilité dans les types de trajectoires temporelles des prix immobiliers à l'échelon du quartier.

Keywords: gouvernance urbaine privée, suburbs, gated communities, analyse spatiale, prix immobiliers, ségrégation

1. Introduction

For almost two decades, gated communities have been under the scrutiny of scholars, especially those addressing the question of whether or not they produce a housing price premium and thus contributing to residential segregation. Earlier studies on housing prices in gated communities have focused either on the price premium produced by gating a neighborhood, by the means of hedonic modeling in the U.S. (Lacour-Little and Malpezzi, 2001, Bible and Hsieh, 2001) or other empirical methods in South Africa (Altini and Akindele, 2005). All studies yield comparable results about the price premium in favor of gated communities, compared to non-gated subdivisions in the same area. Our line of inquiry seeks to analyze how this price premium structures price differentiation patterns between the gated and non-gated areas in the long run.

This paper studies the sprawling suburban areas of Southern California (Santa Barbara, Ventura, Los Angeles, Orange, Riverside, San Bernardino and Riverside counties) by means of a quantitative approach to price change between communities in the same vicinity. Thus, the paper focuses on the specific case of gated communities in the United States, and more specifically in Southern California, and differentiates gated communities from non-gated communities in terms of property values. We further study the patterns of change in property values between 1980 and 2008.

Two overlapping understandings of "gated communities" (hereafter "GCs") have emerged in academic literature. One group of scholars consider them to be a family member of a more general class that includes master-planned communities (horizontal version) and condominiums (vertical version) governed by collective tenure and incorporated organizational arrangements (Mckenzie, 1994, Mckenzie, 2003, Mckenzie, 2006a, Kennedy, 1995, Gordon, 2004, Webster, 2001, Webster and Le Goix, 2005, Kirby et al., 2006, Le Goix and Webster, 2008). Important definitional considerations from this perspective therefore, include the nature of ownership, governance, and management. Such neighborhoods will, for example, have some kind of Property Owners Associations employed by a governing body formed from among residents tied to a common set of interests by contract.

A second group of scholars contends that it is the existence of fences, walls, and security features that distinguishes GCs as a residential form that is significantly different from non-gated places (Blakely

and Snyder, 1997, Low, 2003, Vesselinov et al., 2007, Le Goix, 2006, Vesselinov and Le Goix, 2009). This discourse tends to stress the impact of gated communities on crime, segregation, property values, citizenship, and related behavior.

This paper adjudicates between these two understandings and elaborates on whether gating a neighborhood matters over the private governance effort in shielding property values and producing a price premium across time. Gated developments in the U.S. are residential communities among others, and they are private Common Interest Developments run under the provision of private contractual regulations, with the major difference being that they are gated. Two overlapping lines of inquiry need to be addressed here: (1) Are gated communities different from other non-gated suburban neighborhoods with regard to price increase or depreciative trends? (2) By doing so, to what extent does the enclosure of a neighborhood significantly contribute to price change-patterns in favor of gated communities?

We argue that housing prices describe not only intrinsic characteristics of housing but also the characteristics of place, assessed and perceived at different geographical levels (location in a city, social characteristics of the neighborhood, and those of the street.) Price changes also induce a powerful social filter in metropolitan suburban areas. In an experimental perspective at the lower local scale, this paper elaborates an analysis of property values in areas where planned communities are preeminent features for the period between 1980 and 2008. We identify GCs and non-gated communities using a primary source based on properties on sale in 2008 in real-estate agents' listings. Matched with data at the tract level from Census of 1980, 1990, and 2000, we identify price patterns across time.

The next section of the paper reviews, on the one hand, the territorial nature of GCs and private residential governance in proprietary neighborhoods, in order to better discriminate how gating a neighborhood might generate more price premium than the overall legal and contractual structuring of a private neighborhood designed to avoid negative externalities. On the other hand, we review the issues of GCs and prices in a context of growing prices since the 1980s interrupted by two major crisis (in the mid-1990s and the emergence of the 2008 foreclosure crisis), and we also put in perspective the

specificity of a case study based upon empirical data from Southern California. In the subsequent section, we analyze the complexity of spatial shifts and adjustments in prices, so that we might identify underlying depreciation and valuation dynamics at a neighborhood level, and differentiate time-patterns of prices change over the period between 1980 and 2008, with a special focus on the resulting spatial patterns.

2. Gated communities, private, planned communities and property values in Southern California

In this paper we consider GCs as a real-estate product, a fragment of the suburban fabric, and focus on suburban communities in Southern California. We focus on gated residential subdivisions of single detached houses, and therefore, first define gated enclaves—from an operational and planning point of view—as residential planned communities, described by their perimeter, the complete control of the scheme by one developer, private property with amenities and infrastructures, and the regulation by a set of Covenants and Restrictions and a Property Owner's Association (POA) (Mckenzie, 1994, Gordon, 2004).

In this section, we analyze how the definition of GCs requires addressing of the structuring of private urban governance on the one hand, and how gating a planned subdivision ultimately impacts property values and theoretically sustain the hypothesis of a price premium in GCs, compared to non-gated residential communities. We also specifically characterize the case of GCs in Southern California in a context of a global diffusion of gated urbanism-models.

Gated communities: Providing security and community services

Blakely and Snyder's (1997) book focused academic debate and helped shape the discourse. They took a predominantly morphological view in which gated communities were simply walled and gated residential neighborhoods. From this point of view, they differed from condominium and secured apartment complexes because behind the gates they included shared amenities and spaces (streets, parks, sidewalks, beaches, and so on), which elsewhere in modern cities, were open to everybody.

After almost two decades of academic debate on GCs, one major difficulty in addressing the phenomenon is when comparing the different versions of gated communities that elaborate the same language that describes privatized neighborhoods, but does not cover the same societal impact (Claessens, 2009). Commentators have recorded the phenomenon across national contexts, under a diversity of denominations (Atkinson and Blandy, 2005, Glasze et al., 1999), all with contextual references and an emphasis on historical patterns of enclosures (Low, 2006, Bagaeen and Uduku, 2010). There is nevertheless a noticeable consensus among authors who describe the security logic as a non-negotiable requirement in contemporary urbanism and architecture, and all agree that "both the privatization of public space and the fortification of urban realm, in response to the fear of crime, has contributed significantly to the rise of the contemporary gated community phenomena" (Bagaeen, Uduku, 2010, 3) in Western Europe (Le Goix and Callen, 2010, Blandy, 2006, Raposo, 2006), in post-communist Europe (Stoyanov and Frantz, 2006, Blinnikov et al., 2006, Cséfalvay, 2009a), in the Arabian peninsula (Glasze, 2006); in Israël (Rosen and Razin, 2009), in China (Webster et al., 2006, Low, 2006, Wu, 2005), etc. On the one hand, a strong thesis is the link between security and fear of others—sometimes distinguished from the desire for security of person and property (Low, 2003, Low, 2001). In Argentina and in Brazil (Caldeira, 2000), in the U.S. or in Europe (Billard et al., 2005), and in Mexico (Low, 2001), gating has been associated with a lack of confidence in the public security enforcement. On the other hand, residential preferences and economic rationale prevail, and gated communities are understood as an exit-option from the public realm, from the over-regulated and overcrowded cities, inefficient in providing community services (Cséfalvay, 2009b).

Regardless of local traditions and national legal contexts, there are different organizational types of private residential neighborhoods, differentiated by the way property rights over shared spaces and facilities and over exclusively-used housing units are assigned (McKenzie 1994, Glasze 2005). In condominiums, in addition to individual property in the housing units, the owners hold title to an undivided interest in the common property: Streets, open spaces, amenities, and so on. In stock co-operatives, individuals purchase a share in an entire residential complex, but the co-op owns both the exclusively-owned housing units and the subsequent shared amenities. In corporations or homeowner associations, the common spaces and facilities are the property of an incorporated body set up

specifically for that purpose. In these cases, a covenant is attached to the deed of a residential lot making the owner a shareholder in the corporation with voting rights according to the amount of the share (Glasze 2005).

In this study, we will use the general denomination of "common interest developments," (hereafter CIDs) a term that generically designated the forms of residential co-ownership tenure and organization. By the year 2000 over 15% of the U.S. housing stock was in common interest developments—and the number of units in these privately-governed residential schemes rose from 701,000 in 1970 to 16.3 million in 1998 (McKenzie, 2006b, McKenzie, 2005, McKenzie, 2003). The Community Association of America estimated in 2002 that 47 million Americans were living in 231,000 community associations and that 50% of all new homes in major cities belonged to community associations (Sanchez and Lang, 2005). Only a proportion—varying from 12 to 30% in the region of Los Angeles (Le Goix, 2003)—of these private local government areas are gated.

Gated communities and CIDs in the US: Social homogeneity and the preservation of property values

Many agree that real-estate markets usually consider social and racial heterogeneity as detrimental to property values and land markets: Across history, red-lining, neighborhood associations and land-use regulation have been instrumental in protecting property values (Massey and Denton, 1993). Research on the homeowners movements in Los Angeles (Purcell, 1997) and another recent study in Santa Clara (California) suggest that, "to the degree that local zoning responds to land-market forces, exclusion in residential settings is more a product of racial than land-use composition" (Cervero and Duncan, 2004). There is thus a long history in the U.S. of exclusive regulations being implemented both in planning and land-use documents (Ihlanfeldt, 2004, Kato, 2006), but more significantly in the legal structuring of residential associations by means of restrictive covenants (Kennedy, 1995, Fox-Gotham, 2000, Kirby et al., 2006). As a consequence, the implementation of CC&Rs (Conditions, Covenants and Restrictions), and the overall private urban governance effort in private neighborhoods are not tangential in protecting or shielding property values. For instance, based on a New York gated communities and condominiums case study, Low (2009) considers that private governance structures (condominium and residential associations) designed to exclude others and organize social

homogeneity are as important as the securitaziation strategies in shaping the social project in gated communities and exclusive housing schemes.

Hence, both private urban governance and gated morphology are not independent in explaining the social structure of the community (Low, 2009) or the price premium in gated communities (Lacour-Little and Malpezzi, 2001). The case study of a historical, gated neighborhood in Saint Louis, shows that the premium is decomposed in that part due to the privacy-security effects of gating; and the other part due to private subdivision and the homeowner association, and its proactive regulations and governance efforts to protect the neighborhood from negative externalities (Lacour-Little and Malpezzi, 2001). The authors elaborate and reinforce the findings of Oscar Newman in his study of private streets of Saint Louis, by bringing together gated street and residential association as a means to avoid decay and other externalities in a neighborhood (Newman et al., 1974).

Both CIDs and GCs belong to the same kin by law, but differ from a morphological perspective because of the gates and security features. Gated communities are territories of exclusiveness; building up social homogeneity on security, snob values, fear of crimes and symbolic and physical distance from other (through gates and walls). But all these attributes are not truly independent, as they result from the contractual agreement binding all property owners. This legal perspective helps discriminate gated communities from the rest of the non-gated planned communities in a case study applied to the context of specific U.S. planning (Brower, 1992, Kennedy, 1995).

Indeed this section aims at discussing the ways in which CID and condominium ownership may encourage a kind of speculation around real-estate prices. This discussion helps understand why gating a CID might eventually reinforce the pro-active private governance effort toward property values preservation. To live up to their promise, GCs need to be founded on a financial model that takes account of rising costs due to the obsolescence of infrastructure and amenities managed by the property owners associations. The liberal hypothesis assumes that operating costs of private governance are paid for by the increase in property values.

First, the quasi-governmental regime has a preeminent role in shielding property values: GCs and non-gated developments, as local quasi-governments in terms of provision of public services (McKenzie,

1994, McKenzie, 2006c), act as local consumption clubs of urban services (Webster, 2002). The short-term apparent cost/benefits market efficiency in providing collective services (Foldvary, 1994) must be matched up to the risks of long-term spill-over effects, inefficiency of the decision-making process, residents' lack of involvement (discussed by Blakely & Snyder, 1997; McKenzie, 1998; Low, 2003), and the risks of obsolescence and inflating maintenance costs undermining the tidiness and reputation of a neighborhood and ultimately its property values (Berding, 1999, Miller, 1989).

Second, the application of restrictive covenants to residential neighborhoods has been instrumental in selecting residents throughout the first half of the 20th century, especially on the basis of race (Fox-Gotham, 2000). As discussed earlier, real-estate markets usually consider social and racial heterogeneity as detrimental to property values and land markets. Both developers and governments back such discrimination. Since the U.S. Supreme Court declared residential segregation illegal in 1948, however, restrictive covenants and POA membership have relied on age limitation (for retirement communities, owners must be above 55 years of age) and on required membership (e.g. in co-operative housing or country-club), membership being subject to the approval of the board of directors (Kennedy, 1995). Although no reference to race or color can be made during the membership application process, the issuance of membership is discretionary, based on the principle that any club may regulate its membership (McKenzie 1994, 76), as long as the criteria for selecting prospective buyers remains reasonable. So far, sociability and congeniality have been considered reasonable criteria by the U.S. courts (Brower, 1992).

But some legal cases also highlight the legal specificity of gated communities compared to non-gated CIDs. Indeed, some covenants and regulations strictly derive from the gating and enclosure of a neighborhood and this may have subtle effects on formation of homogeneous communities. For instance, in many GCs, residents have to send a list of guests to the POA when organizing a party a few days in advance for gate access. Such surveillance is a highly selective process and is likely to attract a certain kind of homebuyer. According to Brower (1992) and Kennedy (1995), many court cases and legal restrictions foster the process of social selection. The activity of private militia within a GC is not subject to the 4th Amendment of the U.S. Constitution (1921 Burdeau v. McDowell 256 US 465). Streets, roads and parks in GCs are not legally considered to be public spaces, and therefore

certain constitutional rights (particularly freedom of speech) cannot be guaranteed or may be subject to POA regulation (1997 United States v. Francouer; 1982 Laguna Publishing v. Golden Rain Foundation). Such issues can be viewed as anecdotic, but are indeed instrumental in reinforcing the private governance effort toward private control of the neighborhood, social etiquette, and thus social homogeneity. This exemplifies the legal issues which differentiates a gated enclave from an non-gated CID, and shows how the gating of a neighborhood territorializes the residents, and thus the social homogeneity as promoted by gated communities (Low, 2001). Gating a CID ultimately stresses the private realm, thus reinforces the selection of residents. As it has already been argued earlier, this effort toward social control and homogeneity contributes to the overall effort of shielding property values by the means of private urban governance (Le Goix, 2007).

The impact of taxation in California

Another level of analysis focuses on the interface between private governance and public authorities, which also impacts property values, mostly because of taxation issues in the U.S. and especially in California. Indeed, this metropolitan region has been chosen as a case study for three main reasons: First, the level of diffusion of GCs in the area; Second the legacy of gated and private communities in the area, starting in the early 1930s (Le Goix and Callen, 2010); Third, the specific fiscal context that has favored the diffusion of private residential neighborhoods.

The diffusion of homogeneous residential suburban communities in this region is related to suburban growth; to the anti-fiscal posture; and to the municipal fragmentation dynamics that have affected the Los Angeles area since the 1950s. These are processes that have progressively lowered the fiscal resources available to local governments, while the urban sprawl has produced an increased need for revenue to finance public infrastructure (roads, freeways) in a low-density urban region. In Los Angeles, the anti-fiscal posture has been associated with the incorporation[1] of numerous cities—the first of which was Lakewood (1954). These new municipal governments were designed to avoid

[1] Incorporation is the legal process by which unincorporated land (under county's jurisdiction) becomes a city, once approved by the State (in California, the LAFCO, Local Agency Formation Commissions are in charge of supervising the process) and by 2/3 of the voters. A new municipality can either be granted a charter by the State as large cities are, or be incorporated under the general law, which is the common case.

paying costly county property taxes—which after incorporation were replaced by lower city assessments and better local control over local development and other municipal affairs (Miller, 1981). A second step was the 1978 "taxpayers' revolt"—a homeowner-driven property tax roll-back known as Proposition 13 (Purcell, 1997). Passed in 1978, this tax limitation increased the need for public governments to attract new residential subdivisions, especially those that would bring wealthy taxpayers into their jurisdiction. A third influence on the spatial diffusion of gated enclaves was the rapid growth of the Los Angeles area, sustained by massive population inflow during the 1980s. Common Interest Developments (CIDs) are fiscal "cash-cows" for local public governments enlarging the tax-base at barely no cost, and are efficient in privately funding urban sprawl in the fastest growing areas (McKenzie, 1994, Dilger, 1992). Access control, private security and other infrastructure and services represent a substantial capital and recurrent cost for the homeowners that would otherwise have been subsidized by the general tax-paying public. As compensation, homeowners are granted private and exclusive access to their neighborhoods. This ultimately impacts property values in CIDs and gated communities, as the exclusiveness is theoretically capitalized in land rent, but there is so far no empirical data showing how this capitalization fluctuates irrespective of whether the neighborhood is gated or not.

Gated communities and price premium

An early theorization of gated streets as defensible spaces, has been developed by Newman (1972) and the *Institute for Community Design Analysis*. His studies have been widely publicized and incorporated in public policies through urban design guidelines aimed at preventing urban decay, depreciation of a neighborhood, and crime (Newman, 1996). Newman makes an apology for gating as a device that prevents urban decay by giving social control over the environment to residents. This includes the erection of street barriers in retro-fitted residential neighborhoods as a way of reintroducing public safety, and controlling gang activities. Furthermore the gate, the CCTV, private police, and amenities have to be paid for; gated communities residents bet on property value gains to offset the cost of gating and private urban governance; this consent to pay seems paramount in sorting out residents attracted by a scheme promoting security, exclusiveness, and a gated lifestyle. Previous

researches have shown that GCs enjoy a premium of house prices compared to private neighborhoods in surrounding areas. Hedonic modeling demonstrated the measurable effect of the location of the property within a gated community (Bible and Hsieh, 2001). In Saint Louis, Missouri, hedonic analysis demonstrated a 26% price premium where gates had been erected between 1979 and 1998; by way of comparison, a regular non-gated private neighborhood produced only an estimated 9% price premium over a regular neighborhood (Lacour-Little and Malpezzi, 2001).

This is confirmed in some places, for instance in South Africa, where gated community property values are usually higher than in regular neighborhoods, and this perception is shared by both prospective buyers and real-estate agents (Altini and Akindele, 2005).

But there is some evidence that the price premium is sometimes detrimental to properties in non-gated developments near a gated community. In the Los Angeles area between 1980 and 1990, gated prices showed better strength to real-estate market fluctuations than did prices for regular residential neighborhoods and non-gated CIDs, especially between 1990 and 1995, when the average transaction lost almost half of its value in Southern California (Le Goix, 2007). Such a long-term study conducted on large private enclaves in the U.S. (s.a. Leisure World/Laguna Woods, Orange county), demonstrates that failure of property owners associations occurred when costs rose above a sustainable level compared to rapidly decreasing property values. A majority of average middle class gated enclaves, located within more diverse neighborhoods did not succeed in creating a significant price premium and/or did not maintain significant price growth during the last decade (Le Goix, 2007)[2].

Furthermore, the attractiveness of GCs to prospective buyers, the risk of negative spillovers for those living nearby a GC (Helsley and Strange, 1999), as well as the price premium generated by the gated neighborhood, both fuelled a powerful contagion effect (Vesselinov and Le Goix, 2009). Regarding

[2] Elaborating on Le Goix, 2007, the present paper seeks to analyze price change and gated communities from a different perspective. Antecedent work focused on analyzing the impact of legal structuring of gated communities on property values, with a special focus on the relationships between gating, decreasing property values and obscolescence of a neighborhood. The latter issue is to be seen as very significant in private neighborhoods where all infrastructures are paid for and maintained by residents' homeowners fees. The present paper encompasses a different perspective, on the one hand by comparing price patterns both in gated and non-gated CIDs, which are identified by an *ad hoc* database ; on the other hand by analyzing trends, by the means of a multivariate analysis, in order to better characterize price change in neighborhoods.

crime for instance, the deterrent effect of gates for residents (Atlas and Leblanc, 1994) yields a diversion of crime to other adjacent non-gated communities (Helsley and Strange, 1999). This is a massive spillover for non-residents, and communities nearby might react by building their own gates. At a metropolitan level with already strongly-endured segregation patterns, newer developments adopt a model that has been successful in the vicinity, and by doing so, target niche markets of prospective buyers with rent-seeking strategies. To a certain extent, some older neighborhoods nearby retrofit with gates and walls in order to anticipate and avoid the negative spillover effects over crime and property values.

Main trends: Boom and burst of the bubbles

Two main trends affected property values between 1980 and 2008 (Figure 1). After a continuous increase during the first decade that continuously affected the five counties, the trend reversed between 1990 and 1995: the average transaction lost half of its value, in a drop which was consistent with the real market crisis in Los Angeles, mainly resulting from the burst of a speculative bubble (Jaffee and Kroll, 2001), as well as the 1992 riots, 1993 earthquake, and the floods and fires between 1994 and 1995. More importantly, after 1995 and during a decade of geometrical growth of property values, metropolitan areas followed diverging trends: While Santa Barbara and San Diego areas grew well above the average trend of Los Angeles, Oxnard and Santa Ana-Irvine, the fast growing area of Riverside experienced a slower growth of property values. After 2007 and the sudden foreclosure crisis, the Santa Barbara, Santa Ana and Oxnard metropolitan areas were affected first and harder than Los Angeles and Riverside counties.

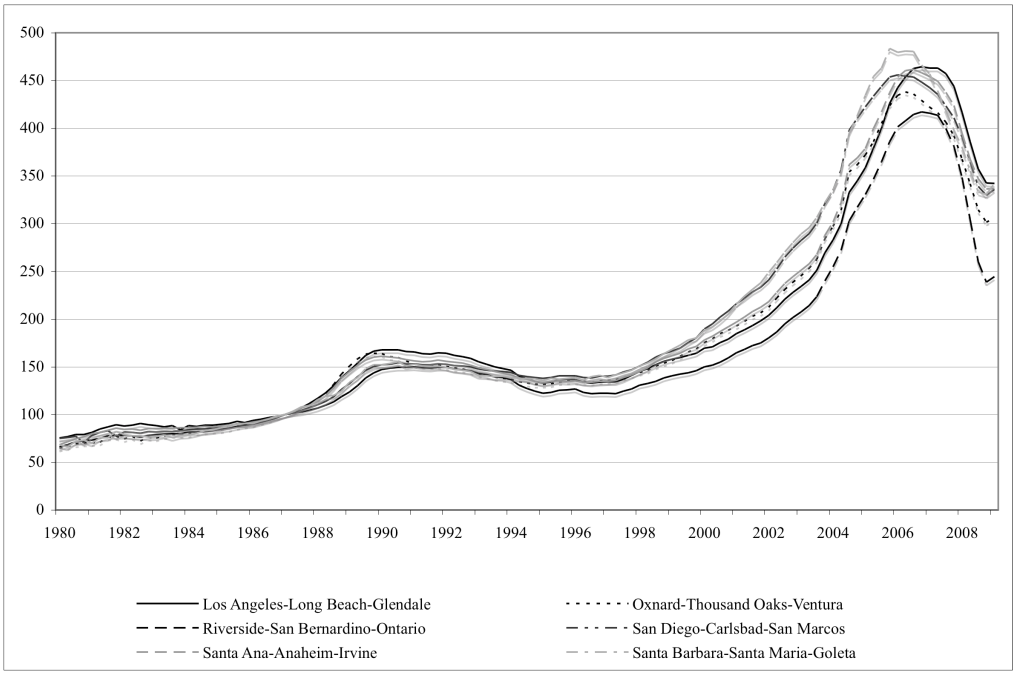

Figure 1. Home Price Index in Southern California's Metropolitan Areas
(Index 100 in 1987, first quarter. Source: Freddie Mac, 2009)

Table 1. Descriptive statistics for properties (quantitative data).

Statistic	***Price (2008)***	***Surface (sq. ft.)***	***Year property built***
No. of observations	9694	9694	9694
Minimum	12000	0	1890
Maximum	28900000	18000	2008
Freq. of minimum	1	193	1
Freq. of maximum	1	1	1
Range	28888000	18000	209
1st Quartile	299000	1616	1985
Median	479000	2194	1998
3rd Quartile	850000	3050	2004
Sum	8472016231	24450841	19319640
Mean	873944.319	2522.265	1992.9
Standard deviation (n)	1386744.336	1500.820	13.729
Variation coefficient	1.587	0.595	0.007

How GCs behave, compared to other suburban communities being our main line of inquiry, we rely upon a 1980–2008 sample of property values at a disaggregated level. We seek to analyze how GCs differentiate from other non-gated suburban communities in terms of price increase or depreciative trends.

A long-term comparison of price patterns between gated and non-gated private neighborhoods is an empirical question that needs further investigation, especially in the context of the current foreclosure crisis. Price rises would normally have positive knock-on effects on substitute properties. A high-end GC in a low-income area of a developing city, for example, will boost local land values. If there are other middle-income housing areas nearby, a GC of sufficient prominence might have an enhancing effect. On the other hand, if GCs are of sufficient size that they effectively introduce a layer of superior housing above the existing housing stock—then, the existing housing might be marked down. This is more likely to happen in times of excess supply. The mortgage crisis thus offers an opportunity to observe the behavior of property prices over time while affluent housing (including gated housing) will be in excess supply in a depressed market, and GCs may ultimately fail to protect property values, and data available in 2008 offers a opportunity to monitor the first effects of the crisis on property prices in GCs.

3. Methodology: A GIS-based analysis of price change in gated and non-gated private neighborhoods

Gated and non-gated private neighborhoods (non-gated CIDs) thus share the overall legal and contractual structuring of a private neighborhood designed to avoid negative externalities, but might discriminate because gating a private neighborhood might generate more price premium and more price stability over time. Deriving from this background hypothesis, we aim at differentiating gated communities from non-gated communities in terms of patterns of change in property values. This section describes data, bias, methodology and specifically discusses the implementation of a *price distance index*, before discussing the main results in the next section.

Identifying properties in gated and non-gated suburban planned communities

Aiming at constructing a dataset that allows identifying properties in gated and in non-gated suburban planned communities, we have extracted the main information about each property from Realtor.com, a website operated by a US federation of real-estate agents. The listings of properties for sale throughout the United States are publicly available online. We query these public listings of single-

family homes in order to get a sample of properties in targeted subdivisions. Elaborating the general definition of common interest developments, we have considered that neighborhoods sharing a privately operated "community amenity" (as referenced in listings) was a good proxy to identify candidate communities. Properties have been geo-coded at the address level. By doing so, we get general data describing the property, community information (gating, private streets, leisure amenities), and also data on the date of construction, the square footage of a house, and estimated property prices (advertised price in November 2008)—thus taking into account the first phases of the mortgage crisis.

In the area defined by the 7 counties of the larger Los Angeles area in Southern California, a sample of 9694 properties has been established. As in Table 1, in a fast growing metropolitan region, the sample of properties in residential subdivisions is quite homogeneous in terms of square footage (mean=2,522 square feet; SD=1,500) and year of construction (mean=1993; SD=13.7); the price introduces indeed much more variance in the sample ($873,000 in average; SD=1,386,744).

According to the available information, we characterize each property (Figure 2. Properties in gated communities, percent of sample population, by Census tracts

Table 2) with a dummy variable (independent variable *property in GC*):

- either as properties in a gated subdivision (coded 1), where the words "guarded," "gated," "patrol," "security features," and "private street/lane" are explicit in the property description;
- or as properties in a non-gated subdivision in all other cases (coded 0).

Data have initially been matched to 992 census tracts (Figure 2). This geographical level has been chosen for sampling reasons so as to avoid having too many geographical units with a small number of properties, which would have been the case with census block groups for instance. Nevertheless, we choose to disregard Census tracts containing less than 3 properties, and we aggregate property values on the basis of median value in order to avoid obvious bias introduced by a single exceptional property in a census tract. As a result, we use a final smaller set of 581 census tracts matched with property values in 2008 and the year the property was built. During a recent field survey (April and July 2010) we assessed the quality of the sample. A set of 618 subdivisions was visited, in Los Angeles, Ventura, Riverside, San Bernardino and Orange counties: On average, our sample underestimates the share of gated communities. An estimate of the sampling bias shows that 10% of subdivisions in the database are qualified as non-gated, whereas they are indeed gated; and only 3% of visited subdivisions are characterized as gated by mistake in the database.

As another cross-check of any artifact due to sampling bias, we have also conducted several field study (between 1999, 2007 and 2010), and furthermore used in subsequent analysis an assessment of the ratio of streets in gated communities by Census tract (independent variable *% gated streets*), based on proprietary data[3].

[3] The data comes from Thomas Bros. Maps®. The company publishes interactive maps that identify private streets. Access to vector maps allows spatial queries of gated streets, in order to identify gated neighborhoods. The files also contain information related to military bases, airfields, airports, prisons, amusement parks and colleges, some of which may also contain private streets with restricted access. Aerial photographs (e.g. Google Earth, MapQuest) are further used to help identify GCs and dismiss non residential gated areas (Vesselinov and Le Goix, 2009).

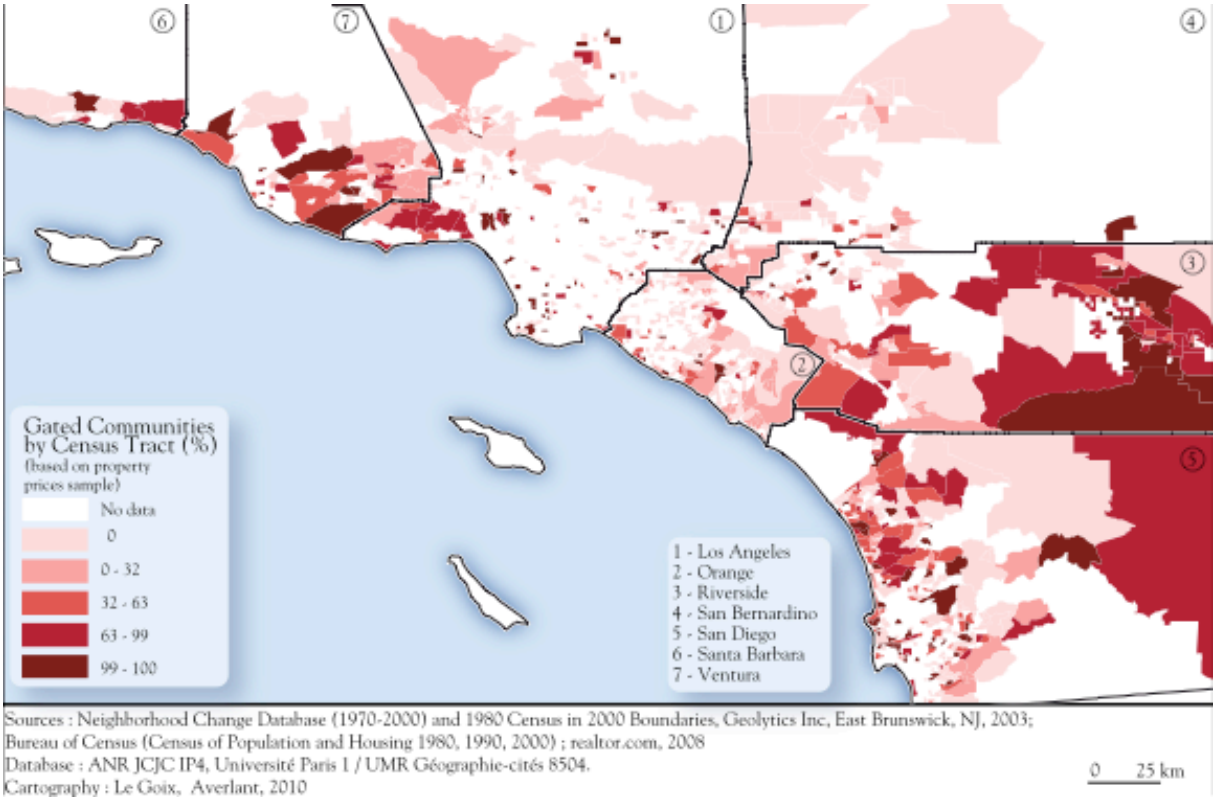

Figure 2. Properties in gated communities, percent of sample population, by Census tracts

Table 2. Properties in gated communities (dummy variable)

Statistic	***Properties in GCs***	
No. of observations	9694	
No. of categories	2	
Category	0	1
Frequency per category	5747	3947
Rel. frequency per category (%)	59.3	40.7

Price data at the normalized Census tract level.

As we seek to analyze price change on the urban edge between 1980 and 2000, a larger geographical scale than the neighborhood or the metropolitan statistical area is required. Property values must be observed not only locally (comparing peer-to-peer a gated community with a nearby non-gated community) but also globally—at the metropolitan region level—given that gated communities, according to their location, express different lifestyle preferences and serves as a subset of the range of market segments (Le Goix, 2006, Vesselinov and Le Goix, 2007). On the other hand, several communities at a local scale often reflect the same socio-economic patterns and the same market segment. As a consequence, at the lower local scale, a price premium identified in one GC might as well be an artifact, being a price premium for a specific location within the metropolitan area (due to specific site rental and municipal amenities), which is indeed profitable to the gated community's residents and other residents living within the area as well, with no consideration for whether the community is gated or not. Such contextual effects are very well rendered by hedonic modeling and multilevel analysis of prices that takes into account the distances from amenities and local externalities in the valuation of a residential property (Orford, 2002). It must be ensured that a positive price change identified for a specific gated enclave is consistent with global patterns of price change in a metropolitan area, in order to determine whether a gated enclave is more efficient in generating property value than non-gated master planned community, everything being equal at the metropolitan level.

Changes in property value have been analyzed throughout almost 3 decades between 1980, 1990, and 2000. Data[4] are available at the normalized Census tract geographical level; GeoLytics is a commercial organization providing such a normalized database in which data for decennial census are matched to the 2000 Census tracts boundaries[5]. Limiting the focus of the research to the subset of Census tracts for which we have a profile of disaggregated property values in 2008 (property data) in subdivisions, we thus extend the period of time to 2008, with a variable describing the median price of properties in our sample extracted from Realtor.com. Inflation effects are corrected according to the U.S. Government standard price index, and prices are expressed in equivalence with 2008 U.S. dollars (constant prices)[6]. As a matter of fact, we do not record the 2008 actual transaction prices, but our dataset is based on advertised prices. This choice has been made with regard for the different variables we have also been able to collect for each of the advertised properties (gated status of the neighborhood, age of the house, sq. footage), all those variables being collected at a disaggregated level. We understand the bias this might introduce, as during price booms, advertised prices may understate transaction prices. The reverse is true during market slowdowns. The net effect may be to understate the range of variation in house prices. This is not a major concern as we only seek to estimate the trend in median property price changes (ups and downs), these trends being unlikely to be inverted because of marginal under- or over-estimate of advertised prices over long periods of time.

Price distance index

The analysis of price change aims at comparing census tracts with an over-representation of properties in GCs (above a threshold of 50%) and Census tracts with an over-representation of non-gated

[4] Variables selected: Median Value All Owner Occupied Housing Units (2000); Median Value Owner Occupied (1990); Median Value Non-Condo Housing Units (1980).

[5] Neighborhood Change Database (1970–2000) and 1980 Census in 2000 Boundaries, GeoLytics Inc, East Brunswick, NJ 2003. As census tract boundaries have considerably changed over time, a remapping of former census boundaries to 2000 definitions is required in order to accurately compare variables across time for a given location. The incomplete coverage by census tract in 1970 and 1980 census, only available in urban areas is an additional difficulty. The normalization of historic tract data to 2000 tract boundaries starts with the an estimate based on block-level weighted geographic data. 1970 and 1980 boundary files are related to 1990 boundary files using correspondance files produced by the Census Bureau, given a computed tract weight. Detailled methodology is published online: http://www2.urban.org/nnip/ncua/ncdb/AppendixJ.pdf [accessed: june 2010].

[6] Source: Consumer Price Index, 2009 (U.S. Bureau of Labor Statistics, http://www.bls.gov). 1$ in 2008 is equivalent of 0,38$ in 1980 ; 0,61$ in 1990 and 0,8$ in 2000.

subdivisions. We implement a method of *price distance index* already tested for price change patterns analysis in downtown Paris (Guérois and Le Goix, 2009).

The analysis at the neighborhood level primarily measures the distance between prices in one Census tract and adjacent (gated or non-gated) tracts. Segregation, concentration and dissimilarity indices are known to be sensitive to spatial auto-correlation (Apparicio, 2000, Grasland et al., 2000, Nelson et al., 2004). It is also well established that these indices usually ignore spatial patterns, depending on the level of spatial auto-correlation (White, 1983, Massey and Denton, 1988, Nelson et al., 2004). To study differentiation and segregation patterns at a local level, we therefore need to implement a function of topological distance (adjacency) in the measure to account for the gradient and the proximity effects.

The proposed local *price distance index* (PDI) accounts for spatial auto-correlation issues, as they measure the level of price discontinuity between two adjacent tracts. Then we compare the PDIs and the spatial distribution of gated areas and non-gated areas. The *price distance index*, in fact the absolute value of median price difference between tracts, will be our main indicator in this comparison between Census tracts with gated communities and CTs with non-gated subdivisions. It has been computed at the normalized 2000 Census tract level. For each year (1980, 1990, 2000 and 2008), the index is based on a subtraction between median property values in a given tract and median property values in an adjacent tract and is the absolute value of the difference for each spatial unit (the line segment, or boundary, between two adjacent tracts).

4. Results: Gated communities contribute to increased price inequalities at the local level

Local trends

Figure 3 shows that price changes follow diverging trends. On the one hand, some areas experience a continuous increase of property values, especially in coastal tracts with a higher site rental, such as in Santa Barbara/Montecito, Newport Beach area and the southern part of Orange county, and the north of San Diego urbanized area (Encinatas, Rancho Santa Fe and Del Mar). The residential tracts located north of Malibu, west of Los Angeles County, and East of Ventura county in the Calabasas/Agoura

Hills/Thousand Oaks and Camarillo area, have also experienced this trend. On the other hand, a relative loss of value between 1990 and 2000, followed by an increase of value between 2000 and 2008, is another trend, especially relevant in the south-west side of Riverside county for instance. At last, it appears that in some areas such as the resort desert city of Palm Springs and its vicinity, where gated communities are a preeminent form in the urban landscape, a relative stability of property values was experienced until 2000, followed by a significant increase of values during the last decade.

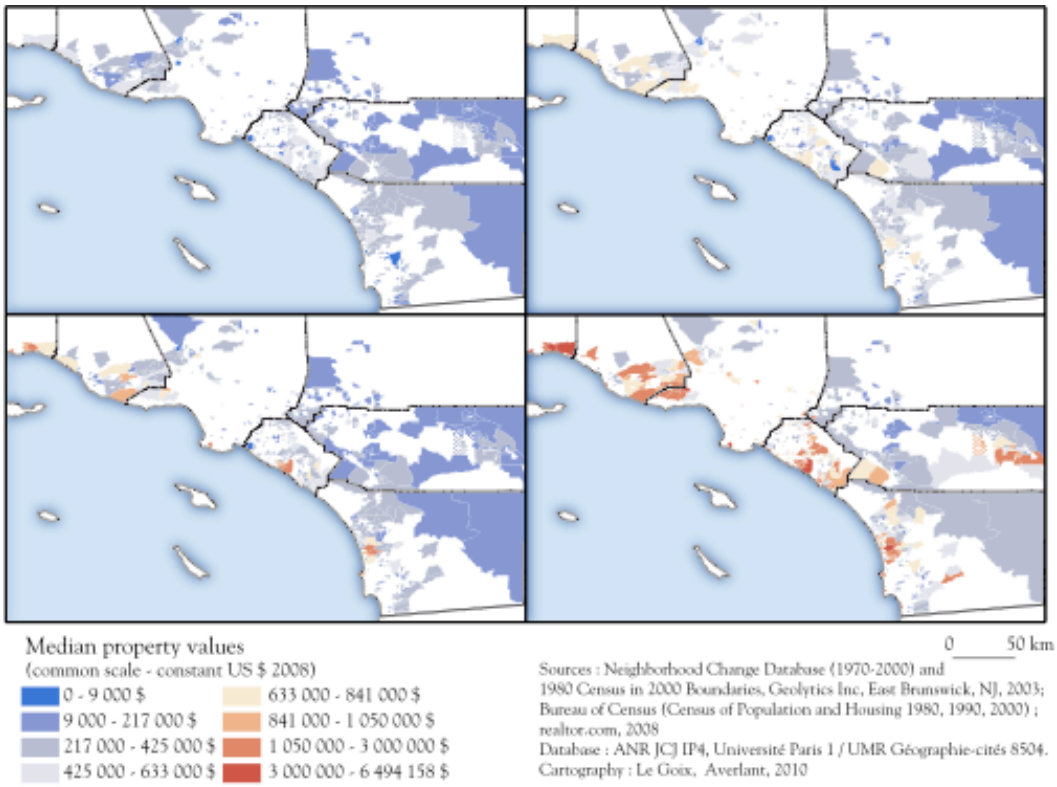

Figure 3. Median property values 1980, 1990, 2000 and 2008 compared on a common scale, in Census tracts with gated communities

Gated communities protect property values

A first step aims at clarifying the trends of price change at the tract level, and comparing them with the percentage of properties in gated communities and non-gated subdivisions by tract.

We apply for that purpose a cluster analysis based on median property prices: Cluster profiles are reported in Figure 4. The typology shows four significant patterns of price change. In addition to

trends at the metropolitan level reported in Figure 1, the results sort out the different phases of accelerating growth of prices over time.

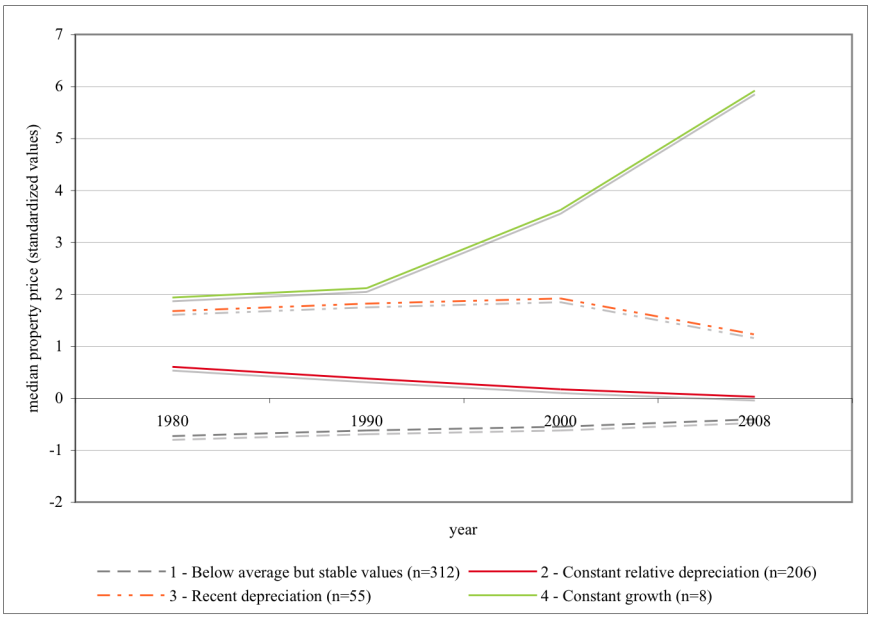

Figure 4. Clusters profiles - A typology of price change patterns by Census tracts (1980–2008)
(Cluster analysis, ward method, Euclidian distance, r.sq.=0.72, standardized values)

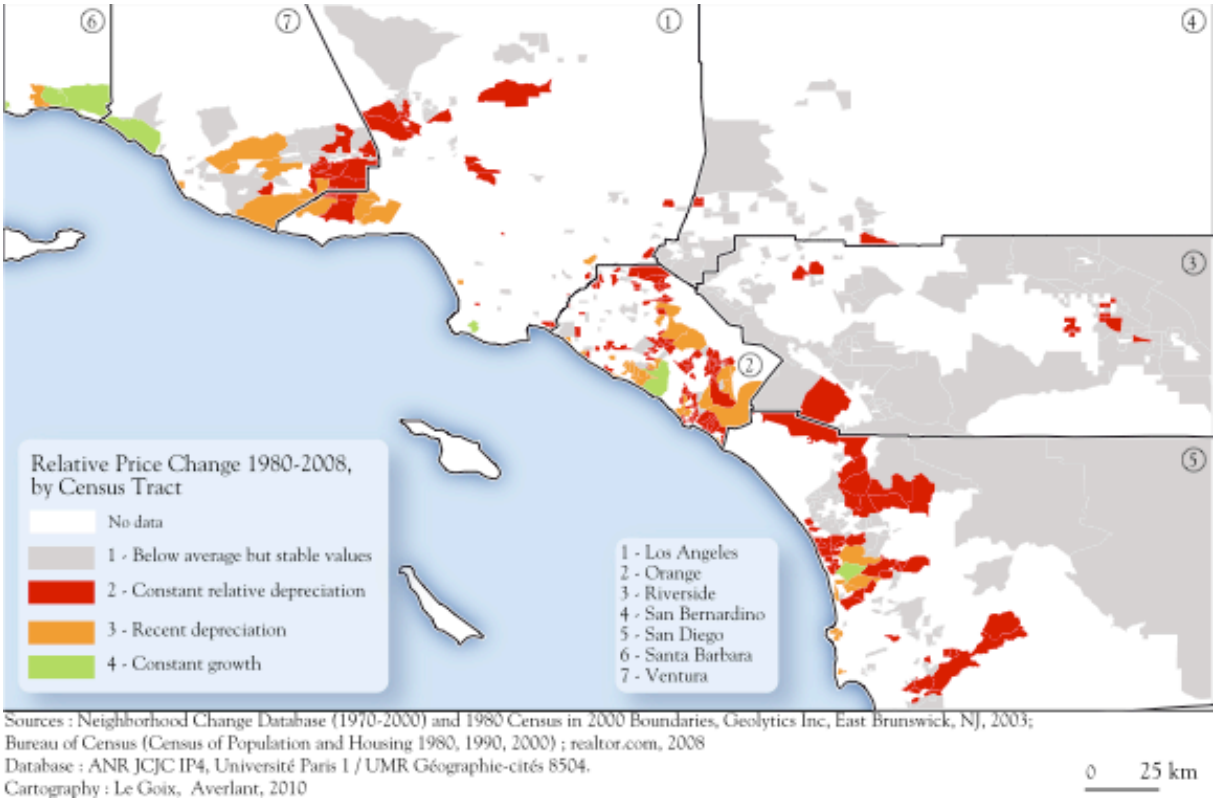

Figure 5. A typology of price change patterns by Census tracts (1980–2008)

The standardized profiles show coherent spatial patterns of relative price change:

- Cluster 1 records below-average but stable property values in constant U.S. dollars, and this trend specifically applies to the desert-side of the suburban areas, north of Los Angeles county (Santa Clarita valley and Palmdale area), west San Bernardino, most of Riverside county, and the east-side of San Diego counties (although these tracts are only partially built up).
- Cluster 2 describes a trend of relative depreciation in constant dollars throughout a period of time, especially on the north and the western side of Los Angeles (Agoura Hills, Santa Clarita for instance), and also in the affluent south of Orange county.
- Tracts described in cluster 3 show higher property values during the first 3 decades, and a recent loss of relative value (2008), all things being equal compared to the average profile of the cluster analysis. This cluster describes places in Ventura county (Camarillo), Thousand Oaks, Calabasas area, but also larger gated developments areas such as Dove Canyon and Coto de Caza, south of Orange county.
- At last, cluster 4 describes a profile of continuous and sustained growth, in areas like Montecito and Santa Barbara, Oxnard in Ventura county, the south of Irvine and Newport Beach in Orange county, and the Rancho Santa Fe area (San Diego county).

This analysis yields first insights on how tracts with a majority of properties in gated communities compare with properties in non-gated developments, in terms of price change profiles. We compare tracts with more than 50% properties in gated communities, and tracts below that threshold. On the one hand, a large majority of tracts show below-average but stable values (cluster 1) or constant relative depreciation (cluster 2), and the gated status is not discriminating in both cases. In a majority of cases, there is no significant contrast between most gated communities and most non-gated communities: 54 percent of both gated and non-gated communities experienced “below average but stable values.” This being said, it is on the other hand significant that a higher share of census tracts with more than 50% of properties in GCs are found in clusters 3 (higher values between 1980 and 2000 but experiencing recent depreciation) and 4 (constant growth), with respectively 36.4% and 87.5% of all tracts in the clusters. Although fewer tracts are described by clusters 3 and 4, both trends

being confined to untypical areas, it is nevertheless significant that in these specific cases, gated communities are more likely to experience "recent depreciation" or "constant growth" than non-gated communities. The statistical relationship is significant, both when considering the percentage of properties in GCs, and the control data set describing the share of gated streets in a CT (Table 3 and Table 4). These trends are confirmed by a Chi-square test, which proves the correlation between gating and favorable trends in price patterns; we also control the effect produced by the date of construction on price trends, and the relationship proves to be weak (Table 4), as a more recent date of construction might also yield higher property values (fashionable architecture, obsolescence of the house, etc.).

Since Blakely and Snyder's typology of gated communities in the U.S. (1997), it has been well-established that GCs are diverse in kind. A vast majority are average standardized product for the middle- and upper-middle class, and a minority of high-end, exclusive, expensive hideaways for the wealthier share of the owners (Sanchez and Lang, 2005), and this is especially true in Southern California (Le Goix, 2006). Indeed, the analysis shows that price trends are on average undifferentiated whether the communities are gated or not. As shown in maps (Figure 3 and Figure 4), a majority of the average middle class gated enclaves, located within the continuum of low to average median property values, do not contribute to measurable price premium between 1980 and 2008. Nevertheless, results show that in some very significant cases, GCs do contribute to fuelling price growth (clusters 3 and 4) This is especially true in the most desired location in the metropolitan areas, such as in the south of Orange county, and in Santa Barbara, Calabasas (West Los Angeles) or Thousand Oaks (Ventura county) areas.

Table 3. Contingency table for percent gated communities and 1980–2008 price profiles by census tracts

Cluster*GC N % in line % in column	***CT with less than 50% of properties in GCs***	***CT with more than 50% of properties in GCs***	*Total*
1 - Below average but stable values	209 66.9% *53.6%*	103 33.03% *53.9%*	312 100% *53.7%*
2 - Constant relative depreciation	145 70.4 % *37.2 %*	61 29.6% *31.9%*	206 100% *35.5%*
3 - Recent depreciation	35 63.6% *8.9%*	**20** **36.4%** ***10.5%***	55 100% *9.5%*
4 - Constant growth (n=8)	1 12.5% *0.3%*	**7** **87.5%** ***3.7%***	8 100% *1.4%*
Total	**390** 67.1% *100%*	**191** 32.9% *100%*	**581** **100%** ***100%***

Table 4. **Statistical relations at the census tract level** (N=581 spatial units)

	Price patterns x % gated streets	***Price patterns x % properties in GCs***	***% properties in GCs x Median building date***	***Price patterns x Median building date***
Clusters X	1-2-3-4	1-2-3-4	+50 % -50 %	1-2-3-4
Clusters Y	+25 % -25 %	+50 % -50 %	Min = 1947 Q1=1980 Q2=1989 Q3=2001 Max=2008	Min = 1947 Q1=1980 Q2=1989 Q3=2001 Max=2008
Chi² (observed value)	21.40	12.12	30.36	21.8
DF	3	3	3	9
p-value	<0.0001	0.007	< 0,0001	0.0093
	***	**	***	**N/S**

A typology of price distance indices

In a second step of the analysis, we measure the level of price discontinuity between two adjacent tracts using the *price distance index* (the absolute value of median price difference between adjacent tracts). Where PDIs are significantly high, there is a statistically significant level of dissimilarity between two contiguous tracts that can then be mapped as a line segment materializing the level of discontinuity. The spatial analysis in this part aims at measuring the contribution of topological distance (Census tract boundaries) on price differentiation patterns.

In order to build comparison over time between census tracts with gated communities and non-gated areas, price distance index (PDI) between tracts in 1980, 1990, 2000 and 2008 (Figure 6 and Figure 7) are classified by the means of a cluster analysis. The interest of the method is such that each cluster represents a different trend of relative differentiation between median property values in one tract and an adjacent tract.

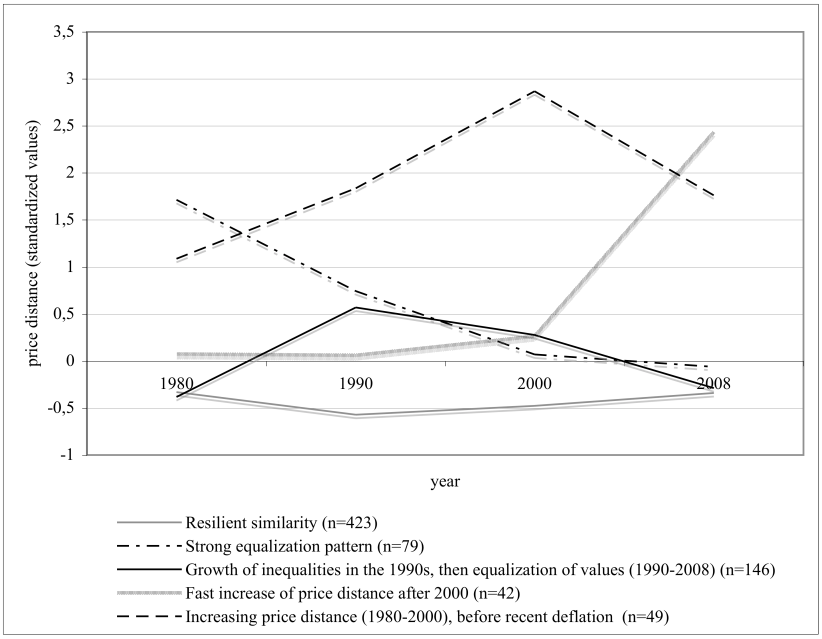

Figure 6. Clusters profiles - A typology of price distance index
(Cluster analysis, ward method, Euclidian distance, r.sq.=0.58, standardized values)

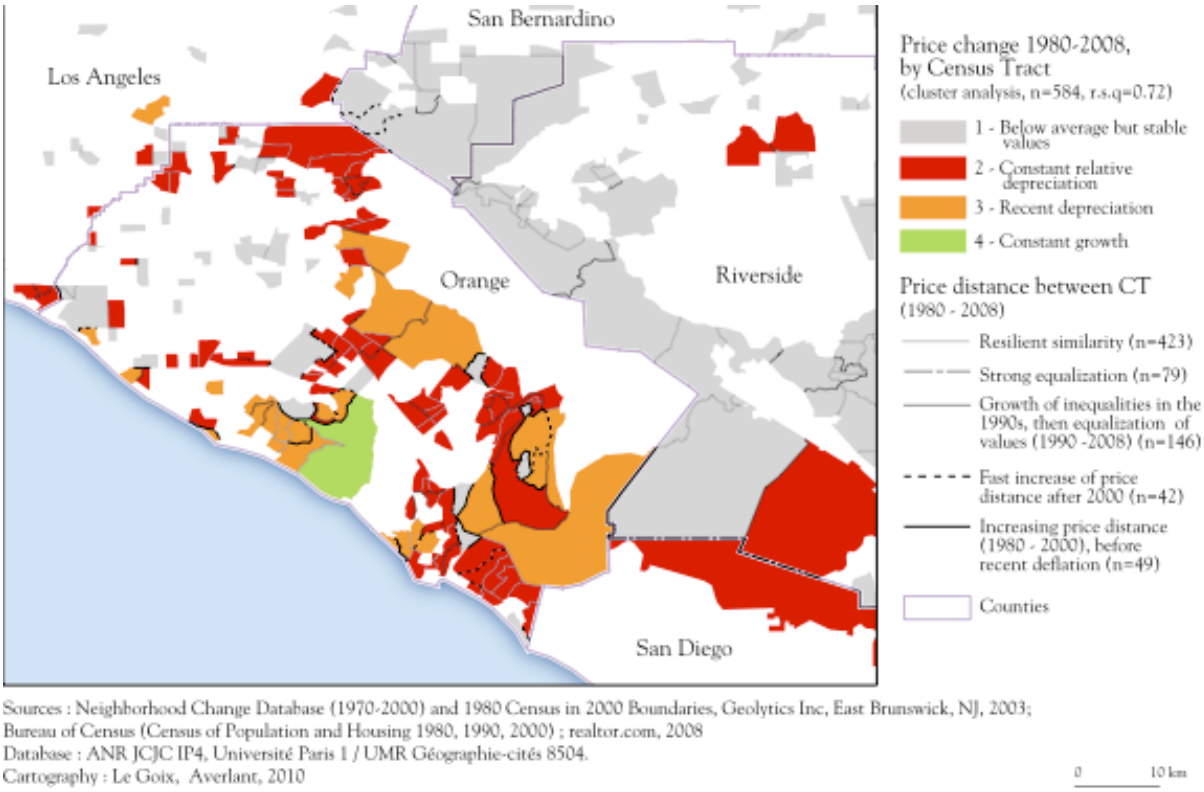

Figure 7. Map of price change patterns and price distance index, south of Los Angeles (Orange, San Diego and Riverside counties, 1980–2008)

- A first cluster, not surprisingly, highlights the fact that a majority of tracts experience the same property prices trends as their adjacent neighbors, thus following the classical patterns of positive spatial auto-correlation. Indeed, everything being equal, the vast majority of segments between tracts (57.2%) belong to a pattern called *resilient similarity,* meaning that median prices remain more or less equivalent on both sides of the tract boundary: Values in adjacent tracts experience a parallel increase during the period of booming prices, and decrease in sync during crisis.

- Cluster 2 describes *strong equalization patterns.* These patterns of decreasing inequalities occur in places where a constant trend toward equalization occurs during the entire period of time between two adjacent tracts (10.7% of all segments).

- Cluster 3 describes a dynamic close to the average profile, showing a *growth of inequalities in the 1990s, then an equalization of values (1990–2008)* (freq.=19.8% of all segments). In many cases, the significance of this specific cluster must be carefully addressed, as it is very specific of newer developments on the urban edge. After the development of pioneer subdivisions in rural and desert

areas (thus favoring higher differentiation of prices), the development by contagion of suburban subdivisions has produced a diffusion pattern of prices (similar houses, similar subdivisions, similar property owners, similar developers on the urban edge), thus favoring an homogenization of prices between adjacent neighborhoods. This pattern seems quite common on the outskirts of the urban edge, which is consistent with the spatial diffusion of planned subdivision, both gated and non-gated.

- Cluster 4 describes locations where price differentiation patterns have boomed after 2000, after a sustained local system of price homogeneity during the first two decades of the analysis (*Fast increase of price distance after 2000*, freq.=5.7%). On average, the price distance index has increased from 0 to almost 2.5 standard deviation, thus corresponding either to urban renewal areas with new subdivision in a previously built-up homogeneous environment; or new pioneer subdivisions in rural locations.

- Cluster 5 describes boundaries between tracts where local price dynamics fuel the spatial differentiation patterns during the first 20 years, followed by a relative equalization of prices between 2000 and 2008 (*Increasing price distance (1980–2000), before recent deflation*, Freq.=6.6%).

Gated communities are more likely to generate price inequalities

In order to offset the risk of ecological fallacy, the typology of price distance index is used to describe the local context of price patterns in which GCs and other subdivisions are located. We can thus analyze how GCs and non-gated subdivisions adjust and correlate with the context of prices discontinuities as summarized by the PDI analysis.

Table 5. Contingency table of properties in GCs and price differentiation patterns.
contingency table of price distance index and percent properties in gated communities on both sides of census tracts boundaries (N=747 line segments); overrepresentation highlighted in bold.

Price distance index (clusters) ***x % of properties in GCs*** N % in line *% in column*	***More than 50 % GCs on both sides***	***More than 50% GCs on one side***	***few GCs on both sides***	***Total***
1. Resilient similarity	69 16.3% *53.9 %*	84 19.9% *46.7%*	**270** **63.8%** ***62.7%***	423 100 % *57.2%*
2. Strong equalization pattern	**22** **27.9%** ***17.2%***	**23** **29.1%** ***12.8%***	34 43.0% *7.9%*	79 100 % *10.7%*
3. Growth of inequalities in the 1990s, then equalization of values (1990-2008)	21 14.4% *16.4%*	35 24.0% *19.4%*	**90** **61.6%** ***21.0%***	146 100 % *19.8%*
4. Fast increase of price distance after 2000	**10** **23.8%** **7.8%**	**19** **45.2%** **10.6%**	13 30.9% 3.0%	42 100 % 5.7%
5. Increasing price distance (1980-2000), before recent deflation	6 12.2% *4.7%*	**19** **38.8%** ***10.6%***	24 49.0% *5.6%*	49 100 % *6.6%*
Total	128 17.32	180 24.36	431 58.32	739 100 %

Table 6. Chi-square test on boundaries between CT level

Price distance (clusters) *x* *Gated communities*	***% gated streets***	***% properties in GCs***
N	739	739
Clusters X	1-2-3-4-5	1-2-3-4-5
Clusters Y	≥ 50 % GCs on both sides ≥ 50% GCs on one side few GCs on both sides	≥ 25 % GCs on both sides ≥ 25 % GCs on one side few GCs on both sides
Chi-square (Observed value) DF p-value	35.5 8 < 0.0001 ***	32.46 8 < 0.0001 ***

We consider the percentage of properties located in gated communities. The information is aggregated at the segment level (line segment between adjacent tracts), in order to be compared with the PDI typology. We basically cluster the variable in 3 categories: More than 50% of properties in GCs on

both sides of the segment; more than 50% on one side only; less than 50% of properties in GCs on both sides. We also apply the same categorization to the control variable describing the percentage of gated streets on both sides of census tracts boundaries, with a 25% threshold only, as a 50% threshold not yielding significant results at the census tract geographical level. As in Table 5, this yields strong evidence that above the threshold of 50% properties in gated communities, there is a higher probability of increased price differentiation as described in cluster 4 (*fast increase of price distance after 2000*) and cluster 5 (*increased price distance in 1980–2000 before deflation of the PDI)*. Furthermore, cluster 5 is more likely to be found where there are only GCs on one side of the Census tract boundaries: Gated communities correlate with stronger price differentiation patterns.

Another trend is described by cluster 2, which shows that strong equalization patterns occur between 1980 and 2008. Everything being equal, segments in cluster 2 are more likely to separate either census tracts with GCs on both sides or census tracts with GCs on one side only. As in Figure 7, they relate to areas where gated communities are preeminent morphologies in in-fill developments, producing a spatial diffusion of gated communities (contagion effect) and by doing so a homogenization of price patterns.

By contrast, everything being equal, segments between tracts with below-the-threshold of 50% properties in GCs, are in relative terms more likely to belong to cluster 1 (*resilient similarity*) and cluster 3 (*Growth of inequalities in the 1990s, then equalization of values (1990–2008)*). This statistical relation shows itself to be very strong (Table 6, Chi-square tests) for both percentage properties in GCs and percentage gated streets, and this tends to prove that gated communities adopt a dual behavior in terms of local context. On the one hand, GCs are more likely to be found in local contexts that introduce greater heterogeneity and instability in price patterns, and by doing so contribute to a local increase of price inequality that destabilizes the price patterns at neighborhood levels, compared to the non-gated communities. On the other hand, GCs spread in contexts that show a very strong stability, in terms of price homogenization at the local level (cluster 2).

Such a dualism in behavior of tracts with an over-representation of gated communities clearly demonstrates a long-running hypothesis about the deterrent effects of gated communities on property

values located outside of the walls, and the correlative contagion-effect of gated communities: Between tracts with an over-representation of GCs and other tracts in their vicinity, the contrasting price time-patterns yields more evidence that the price premium for GCs is detrimental to properties in non-gated developments near a GC.

5. Conclusion

From this analysis of price patterns between 1980 and 2008 in gated communities versus non-gated CIDs, some trends clearly emerge. First of all, GCs are very heterogeneous and diverse in kind, between the average standardized product for the middle class and the high-end coastal community; but on average, the wealthier the area, the more GCs contribute to fuel price growth, targeting tracts with better rent-gap opportunities and tracts on the more desired location in the metropolitan areas. There is a significant correlation between gating and securing a neighborhood and appreciative trends of price growth at the census tract level.

Furthermore, the price distance index analysis highlights how a dual behavior emerges in areas with an over-representation of gated communities. On the one hand, GCs participate in local contexts that introduce greater heterogeneity and instability in price patterns, and by doing so contribute to a local increase of price inequality that destabilizes the price patterns at neighborhood level. On the other hand, GCs spread in contexts that show a very strong stability, in terms of producing price homogeneity at the local level.

Along the axis of price differentiation, gated communities are more likely to generate inequalities than non-gated CIDs, and are indeed more likely to produce a filtering of residents that have a profound impact on segregation patterns. The dynamics of prices in gated communities show that they are more likely to profit from the price bubble periods, and more likely to better resist a sudden drop in values during the foreclosure crisis for instance, while contributing not only a status and a "snob-value," to residents but also a better means to economically differentiate themselves from others.

Moreover, these results yield evidence of the contagion-effect produced by gating—indeed a classical spatial diffusion of innovation—highlighted by a series of census tracts where the share of gated communities and the cluster of price change are affected by strong positive spatial auto-correlation

patterns. This may be explained by a convergence of factors at different geographical levels that have been thoroughly discussed in the literature. Among them, fiscal reasons seem paramount and GCs are a result of planning strategies by suburban local body of governments (counties and municipalities). By providing their own security, infrastructure and services, these developments reduce public financial responsibility while generating new fiscal revenues. As compensation, homeowners are granted exclusive access to their neighborhoods, a condition which enhances location rent and positively affects property values. Therefore, these developments are instrumental in transferring the cost of urban sprawl from public authorities to private developers and homeowners and have been popular and efficient planning tools in fast growing areas.

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