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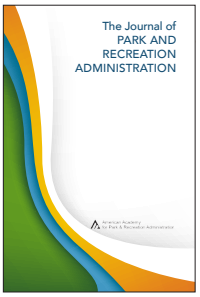

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Regular Paper

The Impact on Property Values of Golf Courses in the United States

John L Crompton
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Executive Summary

Between 2005 and 2017, the net number of 18-hole equivalent courses in the U.S. declined by 1,063. In recent years, the closure rate of courses has been approximately 200 a year, resulting in potentially substantial losses in property values for residents who have paid a premium to reside in proximate locations to them.

Findings from 21 studies suggested eight managerial and research insights. First, there was a rapid decrease in the premiums accruing to properties located one or two blocks away from fairways that lacked a view of the course. Second, with only one exception, all studies in the review treated "frontage properties" as a homogeneous variable, which is oversimplistic. Third, most of the analyses bundled all types of golf courses into a single generic variable which assumed the same premium was associated with all of them, but quality of courses, and hence premiums, are likely to increase with their level of exclusivity. Fourth, vacant lot premium percentages ranged from 39%-85% and were much higher than those of developed lots.

Fifth, premiums in three of the four studies reviewed that focused on single courses were substantially larger than those in studies that incorporated multiple courses. If all else is equal, it seems likely that single course analyses provide a more accurate picture of fairway premiums, because studies that incorporate multiple golf courses report an average premium across all of them and averages hide variations. Sixth, most recent studies included golf courses as one of multiple amenities in mega studies in

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expansive geographical areas. This means their premiums were represented by a single mean value, which is inappropriate because it hides wide variations.

Seventh, studies incorporating many golf courses that measured the distance of all properties in the sample to the nearest golf course typically reported low premiums. This reflected the inappropriateness of the measure, since it included many properties located many miles from a golf course. Finally, none of the studies considered the likelihood of different premiums being associated with different course configurations. It seems likely that small premiums would be associated with long-established core courses constructed by municipalities or private clubs to provide opportunities for golfers to play the game without regard for their impact on real estate. In contrast, premiums for courses in golf communities intentionally threaded around real estate and designed to appeal to large numbers of non-golfers by creating green viewscapes are likely to have relatively high premiums.

Keywords

Property values, golf courses, impact, trends

Introduction

Homes that are similar in size, age, and design often have very different values in different locations. Like other animals, humans have preferred habitats for which they are prepared to pay higher prices. There is a segment of the population who regard proximity to golf courses as a preferred habitat and who will pay a premium to live nearby. The paper commences with a description of the evolution of the relationship between golf and real estate. This provides context for the review of empirical studies that have reported the impact on property values of investments in golf courses. The concluding section discusses managerial and research insights emerging from the review.

The Symbiosis between Golf and Real Estate

Almost all golf courses constructed before the Second World War were commissioned by the upper-class members of private clubs and, for the most part, had little connection to real estate (Adams & Rooney, 1985). There were early exceptions such as Pinehurst Village in North Carolina planned by F.L. Olmsted Senior in 1895 (Stach, 2007), and Lake Wales in Florida planned by F.L. Olmsted Junior in 1915 (Whitten, 2017), but these were outliers.

The intimate symbiotic relationship that emerged between golf and real estate in the latter decades of the 20th century had two catalysts. First was the master-planned community of Sea Pines Plantation on Hilton Head Island, South Carolina, which was developed in the late 1950s and 1960s (Danielson, 1995). Sea Pines introduced three major innovations. First, it illustrated there was a demand for high-quality leisure activities and environments among relatively wealthy "empty nesters" and retirees. Second, it demonstrated a course that meandered through less attractive land could enhance its value by creating extensive amounts of green space and water around which building lots could be located. Third, Sea Pines exercised private control over the development through extensive use of covenants and deed restrictions, which protected

the integrity of the project. The considerable publicity Sea Pines received stimulated widespread imitation, emulation and adaptation across the U.S.

Ostensibly, much of the enhanced land value and accelerated absorption rates arises from golfers' desire to have convenient access to a proximate appealing course. However, Sea Pines confirmed there were two other major contributing factors. The first is image. Golf has connotations of affluence and prestige. Some may seek to enhance their self-esteem or social standing by buying into a development with this image. A complementary source of enhanced value is the visual and physical access to attractive open space that persuades non-golfers to pay a premium price for their homes.

The second catalyst stimulating the symbiotic relationship was the embracement of golf by the middle-class who emerged in the post-World War II economic boom with the time, money and desire to engage in more recreational activities. In 1950, there were 3.5 million golfers (National Golf Foundation & McKinsey Company, 1999), By 1970 the number had more than trebled to 11.2 million. In 1987, further optimism was fueled by a report commissioned from the eminent McKinsey consulting company, Strategic Plan for the Growth of the Game. (National Golf Foundation & McKinsey Company, 1987). The CEO of the National Golf Federation (NGF) at that time who commissioned the report subsequently recalled its impact:

> The centerpiece for that plan was a clarion call to build "A Course a Day" from 1990 to 2000 in order for the golf industry to meet the anticipated demand for golf. The slogan of A Course a Day was featured in PGA Tour television public service announcements (PSAs) and caught fire with the media. This led to the new perception in the business community that there was a great opportunity for profitable investments in the golf industry. The promotional strategy worked. (Hueber & Worzala 2010, p. 13)

Table 1
Trends in U.S. Golf

	1970	1980	1990	2000	2003	2016
Golfers (millions)	11.2	15.1	24.2	28.8	30.6	23.8
Rounds Played (millions)	266	358	421	518	495	456
Golf Courses (HEQ)	7,516	9,582	11,178	14,268	14,827	13,927
Golfers Per Course	1,490	1,533	2,058	1,780	2,064	1,686
Rounds Per Course	35,370	36,345	40,340	36,300	33,378	30,542
US Population (millions)	205.1	226.5	249.6	282.2	290.1	325.7
Percent Playing Golf	5.4%	6.7%	9.7%	10.2%	10.5%	7.3%

Table 1 shows the number of golfers in the U.S. increased from 11.2 million in 1970 to 30.6 million in 2003 (National Golf Foundation, 2017). The NGF defines a golfer as an individual aged 18 or over who played at least one round in a year on a regulation-length course. To accommodate this growing demand, an average of 400 facilities a year opened through the 1990s so by 2003, which was the peak demand year for number of golfers in the U.S., there were 14,827 18-hole equivalent (HEQ) courses—an increase of 6,601 in the three decades since 1970 (National Golf Foundation, 2017a).

Since the peak demand year in 2003, the number of golfers has declined by 6.8 million—a loss of 22%. Decline in the number of golfers led to a decline in all the other indices shown in Table 1. By the end of the Great Recession in 2011, participation had dropped to 25.7 million, and consistent decline continued, so by 2016 it was 23.8 million. (National Golf Foundation, 2017a). A small number of new courses open each year, but the much larger number of closures have resulted in annual net reductions. For example, in 2017, 205.5 facilities permanently closed, while only 15.5 new courses opened. By 2017, there were 1,063 fewer courses than in 2005 (National Golf Foundation, 2018).

This decline is not unique to the U.S. In England and Japan, the numbers playing golf declined by 25% and 40%, respectively, since their peaks in the 1990s (Neate, 2016). In Australia, club membership peaked at 500,000 in 1998 and had declined by over 15% by 2016. A survey of clubs revealed that 50% of clubs were in financial distress, and 51% of them had fewer than 100 members (Mannix, 2014). The oversupply of courses has likely been a factor in the challenge to sustain premiums for properties proximate to a golf course.

Why has Golf Participation Declined?

A former CEO of the NGF concluded: "The marriage of golf and real estate development has ended in a divorce, and the chances of reconciliation are unlikely given the irreconcilable differences" (Hueber & Worzalz, 2010, p.16). Three main factors led to this conclusion: Cost of playing, difficulty of the courses, and incompatibility with contemporary lifestyles.

Construction costs per hole increased from $12,000-$14,000 in the 1960s to $240,000-$500,000 in the 1990s. These increases were attributable to courses being constructed on marginal, less attractive land; a lengthening of courses; and multiplication of the number of accoutrements such as driving ranges. Maintenance costs per hole rose from $60,000-$120,000 in the 1960s to $900,000-$1.5 million in the 1990s (in standard 2018 dollars), reflecting the greater costs associated with maintaining more elaborate courses (Fazio & Brown, 2000).

A decline in number of golfers and an increase in maintenance costs results in higher prices. Resistance to higher prices results in less revenues for maintenance, so quality deteriorates. The beautiful, manicured green sward incrementally over time deteriorates to the point where it becomes ragged and unsightly. Property values drop markedly when deterioration starts and no solution to reverse it is evident. Frontage properties not only lose their premiums; they may incur a negative penalty since interior properties are not as exposed to the unsightly deterioration.

The conventional wisdom among golf residential developers was courses with name-brand architects that had a reputation for being very challenging to play generated premium real estate lot prices. Golf architects had a vested interest in building difficult courses, because this was a primary criterion for appearing in various "top-ranked

courses in the country" lists. Inclusion on such lists escalated their fame as designers and the fees they could charge for future commissions. Longer courses emerged in response to the substantial technological advances in equipment that enabled professionals to drive the ball much further. In some cases, maintenance practices exacerbate a course's level of difficulty by making the greens too fast, the fairways too narrow, and the rough too high and thick so golfers cannot find their ball (Hueber, 2012). All of these actions made courses too difficult and frustrating for most golfers, who did not continually invest in the latest, most expensive equipment and whose handicaps were in the teens. They wanted to have fun playing, not to be embarrassed with high scores on a difficult course.

A third factor accounting for the decline in golf participation is that it fits poorly with contemporary lifestyles. Its image of being formal, elitist, and exclusive is inconsistent with society's growing insistence on informality and inclusiveness. The elitist image is reinforced by the high cost of equipment needed to play, dress codes, and multiple obscure petty rules. Further, typically it takes 4 to 5 hours of travel and playing time to complete an 18-hole round. For millennials, the stereotype of male wage earner and female homemaker and child-nurturer has disappeared. As females have entered the professional workforce, child-rearing and household chores have become a joint responsibility. In past eras, males may have been comfortable leaving the family for such a long time to play golf, but in many households, that is no longer acceptable. The emphasis is on recreational activities in which the whole family can participate and which facilitate family bonding.

How Much is the Golf Course Premium?

The context described in the first section of the paper makes it clear that premiums rest on a foundational assumption that a course remains financially viable. For those courses where this assumption is no longer valid, premiums will be substantially reduced or disappear.

When developing a new residential course, a challenge for developers is to apportion its investment cost among all the lots based on the extent to which each individual parcel benefits from it. If the premium for each parcel is unknown before construction of the development commences, then risk to the viability of the entire project is increased. The repercussions of this are that "lenders require a high rate of return in compensation for that unknown level of risk, and this raises the cost of debt and reduces the project's feasibility relative to conventional developments" (Miller, 2001, p. 7).

For the most part, golf community developers use the standard real estate procedure of reviewing the prices of comparable developments and pricing their lots similarly. Conventional wisdom was that a lot facing directly on to a golf course was likely to sell for a premium of 40%-75% relative to an interior lot in the same community, or up to double the value of an equivalent lot in a non-golf master planned development (Dugas, 1997; Hueber, 2012; McElyear & Krekorian, 1987; Muirhead & Rando, 1994). In the 1990s, GIS mapping, electronic multiple listing data on home sales, and sophisticated software programs encouraged more use of hedonic pricing models (Rosen 1974). This meant that it was possible to supplement conventional wisdom with scientific data. Tables 2, 3, and 4 summarize the findings from 21 analyses reported in the scientific literature that used the hedonic method.

Table 2

Property Premiums Derived from Empirical Studies of Golf Course Vacant Lots and Single Courses

Author and Publication Date	Data Collection Period	Location	Sample Size Control	Sample Size Golf	Premium
VACANT LOTS					
Rinehart/Pompe 1999	1989-1994	Seabrook Island, SC (Private course)	64 Interior lots	83 Frontage lots	39%
Wyman/Sperry 2010	2000-2008	Lake Keowee, SC (Private course)	120 Interior lots	32 Prime frontage lots 47 Ordinary frontage lots	85% 42%
SINGLE COURSES					
Asabere/Huffman 1996	1992-1994	Mount Laurel, New Jersey (Public course)	78 Non-golf	27 Frontage lots	7.9%
Nicholls/Crompton 2007	1997-2001	College Station, TX (Private course)	284 Interior lots	21 Frontage lots	26%

Vacant Lot Studies

The first two studies listed in Table 2 investigated the premiums associated with vacant lots. These have two advantages compared to analyses of built-out residential developments. First, they are unencumbered by the distortion effects of size, quality and age of housing structures (Kauffman, 2006). Second, golf premiums are more likely to be a function of lot location than built housing value, because the cost of building a given house in a golf community is likely to be approximately the same irrespective of where it is located. This means that when premiums are expressed as a percentage, there is likely to be a substantial difference between those of undeveloped lots and those of built-out developments. Consider the following:

	Lot cost	House cost	Total cost
Prime Frontage	$250,000	$200,000	$450,000
Interior	$100,000	$200,000	$300,000

In this example, the premium for the vacant lot compared to an interior lot is 150% ($250,000/$100,000), but the premium when the lot is developed is 50% ($450,000/$300,000). As the house cost increases, the premium percentage decreases. Thus, if the house cost is increases to $400,000, then the premium for the prime frontage developed property declines to 30% ($650,000/$500,000). This explains why the premiums reported by the first two studies in Table 2 are much higher than any others reported in Tables 2, 3, and 4.

Vacant lot premiums are of most interest to developers because lots are the product they sell. The results of the two vacant lot studies are reasonably consistent with the conventional wisdom that frontage golf premiums are in the range of 40% to 70%. However, both studies were in resort residential golf communities, and it is reasonable to speculate their premiums would be higher than those associated with courses located in non-resort communities. The first lot study compared 83 frontage lots with 64 interior lots in a gated island community in South Carolina and reported a premium of 39% (Rinehart & Pompe, 1999). A subsequent study undertaken in a similar community in a similar location, classified premiums for frontage locations into two categories: Prime golf course views which embraced use of water, putting greens, and extended fairway views of over 350 feet from other frontage sites (n=32); and non-prime frontage sites(n=47). Compared to interior lots, non-prime frontage sites had a premium of 42%, while the premium for prime frontage sites was 85% (Wyman & Sperry, 2010).

Single Course Studies

Two studies reported findings related to a single course. An early 1996 analysis showed a relatively low premium of 7.9% for frontage lots (Asabere & Huffman, 1996), which was much lower than the premium reported in the later study. It was suggested this may be attributable to the course being lower quality than courses in the later studies which, "validates that it was reasonable for real estate developers and practitioners to make the assumption that if they spent the money for a higher quality golf course they could command a higher premium for their lots" (Hueber, 2012, p. 48). The later single course study reported much higher premiums of 26% for frontage lots (Nicholls & Crompton, 2007).

Multiple Course Studies

Nineteen analyses incorporated multiple golf courses. They used two different approaches: (i) Creation of buffer zones around courses and inclusion of only those properties when estimating the golf course premium, or (ii) measurement of the distance of all properties in the sample to the nearest golf course.

Table 3 summarizes the results from 12 studies that used buffers when estimating the impact of multiple courses. The same author was involved in three of the early multiple course studies. Two analyses reported premiums of 7.6% and 4.8% for three privately owned and operated golf courses in Rancho Bernardo, a suburb of San Diego (Do & Grudnitski 1995: Grudnitski & Do, 1997). His third study, undertaken in Metropolitan Las Vegas, classified eleven golf courses located in golf residential communities into three categories: Four day-fee courses (n= 312); three semi-private courses (n= 1,137); and four private courses (n= 389). Home values were compared to home sales in the same price range ($100,000 -$500,000) in proximate non-golf residential communities. The analysis showed the highest premiums of 12.5% were associated with houses in private communities, while premiums in semi-private and public golf course communities were 6% and 5.7%, respectively (Grudnitski, 2003) This study highlighted the importance of recognizing that different types of golf courses are likely to generate different levels of premiums.

A subsequent study in Omaha, Nebraska reinforced the importance of moving away from a single generalized variable termed 'golf courses' (Shultz & Schmitz, 2009). It estimated the frontage premium on single-family homes at 20 different courses classified into four categories: Three municipal (publicly owned); ten privately owned public (no membership costs, open to the public); five private-equity (require membership, owned either by the players or by homeowner associations); and two private non-equity (owned by investors). Premiums for the course types listed in order of magnitude were 28% (private non-equity), 15% (public), 9% (municipal) and 4% (private-equity). It seems reasonable to infer that the private non-equity investors who were seeking to maximize their return from real estate sales intentionally designed and developed their courses to achieve that end.

In Portland, Oregon, two studies led by the same researcher reported different results. The first study included 497 single-family home sales that were within 1,500 feet of one of the city's eight golf courses (Lutzenhiser & Netusil, 2001). Table 3 shows the premium for properties within 200 feet of the course was 21%. This was higher than that associated with three other types of open space the authors analyzed (i.e., natural area parks, urban parks, and specialty parks, but the premium declined substantially beyond frontage properties although the decline was not always linear.

Table 3

Property Premiums Derived from Empirical Studies of Multiple Golf Courses that Used Buffer Zones

Author and Publication Date	Data Collection Period	Location	Sample Size Control	Sample Size Golf	Premium
Do/Grudnitski 1995	1990-1993	Rancho Bernardo, San Diego (3 private courses)	501 Proximate non-golf lots	216 Frontage lots	7.6%
Grudnitski/Do 1997	1990-1993	Rancho Bernardo, San Diego (3 private courses)	157 Proximate non-golf lots	157 Frontage lots	4.8%
Grudnitski 2003	1998-2001	Metropolitan Las Vegas, NV	413 Sales in non-golf residential communities	Frontage Lots: Public courses: 372 Semi-private courses: 1,137 Private courses: 389	 5.7% 6% 12.5%
Schultz/Schmitz 2009	2000-2006	Omaha, NE (20 courses)	651 2006 1038 763	Frontage Lots: 3 Municipal courses: 221 10 Public courses: 759 5 Private equity courses: 60 2 Private non- equity courses: 284	9% 15% 5% 28%
Lutzenhiser/Netusil 2001	1990-1992	Portland, OR (8 courses)	16,636 Single family home sales.	497 sales within 1,500ft of a course	<200: 21% 201-400: 12% 401-600:4% 601-800: 13% 801-1000: 13% 1001-1200:7% 1201-1500: 6%
Netusil 2005	1999-2001	Portland, OR	30,014	Frontage: 111 200'-1320: 1,117 1320-2640: 2,956	<1% 3.3% 7.3%
Asabere/Huffman 2009	2001-2002	San Antonio and Bexar County, TX (multiple courses)	"Proximate" to a golf course	388	8.7%
Beron et al. 2001	1980-1995	Los Angeles Metropolitan Area	840,000 Single family home sales	1,680 Sales bordering a golf fairway	Mean 8.25% Range 0.05%-16.8%
Bark et al. 2011	1998-2003	Tucson, AZ	6,383 Sales beyond 1,056 ft.	Adjacent homes: 133 Not adjacent, but within 1,056 feet: 200	Premium 12.7% Premium 1.8%
Lansford/Jones 1995	1988-1990	Lake Travis, Austin, TX	519 Homes within 1 mile of the lake	74 Frontage fairway lots	5.5%
Heinrich/Kashian 2010	2002-2008	Muskego, WI (2 courses)	1203 Sales beyond 1000ft.	Adjacent: 17 Within 500 ft: 61 Within 1000 ft: 4	<2% <2% 0%
Stetler/Venn/Calkin 2010	1996-2007	Northwest Montana	17,693	531 frontage sales	19.6%

When the lead author used data collected almost a decade later with a substantially larger sample she reported very different results (Netusil, 2005). Premiums for three buffer zones around golf courses were less than 1% within 200 feet (n=111); 3.3% for the 201 to 1320 feet buffer (n=1,117); and 7.3% for the 1320-2640 feet (n=2,956). These findings were not merely different from those reported in her earlier study; they were antithetical in that premiums increased as distance from the courses increased. The author neither acknowledged nor attempted to explain the differences. The obvious speculative interpretation is that they were a function of the different samples, which suggests that neighborhood characteristics have a deterministic effect on premiums.

Studies in three other major cities appeared to confirm the trend in the earlier Portland analysis. In Metropolitan San Antonio, the 8.7% premium associated with homes close to a course was the highest premium among several amenities included in the study (Asabere & Huffman, 2009). In Los Angeles, a large data set developed separate models for each year of annual sales over a 16-year period. The contribution of golf to properties bordering a golf course in the annual models ranged from .05% to 16.5% with a mean premium of 8.25% (Beron, Murdoch, & Thayer, 2001). In Tucson, Arizona, properties adjacent to one of the six courses in the study area showed a 12.75% premium, but for nonadjacent properties within 1,056 feet the premium dropped to 1.8% (Bark, Osgood, Colby, & Halper, 2011).

The literature search revealed two suburban analyses that used buffers to measure golf course impact. An early study focused on the impact of Lake Travis and its fluctuating water levels in a region located 10-20 miles from the center of Austin. It revealed a golf course premium of $6,953 (5.5%) on an average home, which was much lower than the premium of $79,000-$102,000 for lakefront property (Lansford & Jones, 1995).

In a rural context, two studies reported very different results reflecting the different foci of their economies. Muskego in Wisconsin is a relatively rural community of 23,000 residents with many of the homes proximate to its three lakes and farmland. The hedonic analysis revealed the city's two private golf courses had a positive but small impact on property values, and it was much lower than the premium associated with proximity to a lake (Heinrich & Kashian, 2010). Availability of extensive open space that defines rural communities, suggests any golf premium will be limited to a course's convenience to local players, rather than incorporating a premium for "green relief" from urbanization.

In northwest Montana, the effect of wildfire-burned areas on home prices on a large sample was measured (Stetler, Venn, & Calkin, 2010). This area of the northern Rocky Mountains has numerous natural amenities so it has become a major recreation destination, and retirement and second-home area. These major facets of the area's economy probably explain the reported premium of 19.6% for properties with frontage on one of the 16 golf courses in the study area.

Table 4 summarizes results from the five studies that adopted the second approach to assessing premiums, that is, measuring the distance of all properties in the sample to the nearest golf course. The mean and range of distances in Table 4 indicates this all-inclusive approach meant many properties in the analyses were located many miles from a golf course. It seems improbable those owners would pay a golf premium, since Tables 2 and 3 indicate most of the premium for golf accrues to properties adjacent to

fairways. Inevitably, the aggregation of fairway properties with those located several miles away that likely had zero golf premium resulted in very low average premiums.

Table 4

Property Premiums Derived from Empirical Studies of Multiple Golf Courses Undertaken without Buffer Zones

Author and Publication Date	Data Collection Period	Location	Sample Size	Distance to Nearest Golf Course (Feet)		Premium
				Mean	Range	
Henderson/Song 2008	2004	Wake County, NC	14,564	10,666	152-34,699	0.01% 2% if within 1,500 feet of a course
Anderson/West 2006	1997	Minneapolis/St. Paul Metropolitan Area (153 courses)	24,862	6,718	0-23,427	0.6%
Bell et al. 2009	1993-1998	Concord & Sudbury River Valleys, MA	1,594	7,587	0-22,021	5.2%
Cho et al. 2011	2001-2004	Tennessee Section of the Pigeon River Watershed	497	16,879	N/A	Not significant
Cho et al. 2011	2001-2004	North Carolina Section of the Pigeon River Watershed	595	13,117	N/A	Significant but small
Larson/Perrings 2013	2000	Metropolitan Phoenix, AZ	47,546	7,958	0-110,390	3.4%

This point was partially illustrated by Henderson and Song (2008). The analyses included both types of measure: Properties within a 1,500-foot buffer of a course, and distance to the nearest course. The evidence in Tables 2 and 3 suggests properties beyond a 500-foot buffer are unlikely to pay a substantial golf premium so the authors' use of a 1,500-foot buffer was likely to include many properties with very low or zero premiums. Hence, it was not surprising that the authors reported an average premium of only 2% for those in the 1,500 buffer. However, this was much higher than the 0.01% average premium when distance to every property in the sample was measured.

The earliest study to measure premiums for all properties in the sample used data collected in the mid-1990s. It was undertaken in a Massachusetts river valley and was comprised of four urban communities interspersed with stretches of rural areas. The 11 public and private golf courses in the hedonic analysis ranged in size from 11.6 acres to 192 acres with a mean of 90 acres, indicating several of them were less than 18 holes, and the average premium was 5.2% (Bell, Boyle, & Neumann, 2009). Two subsequent analyses using this approach reported premiums of 0.6% (Anderson & West, 2006) and 3.4% (Larson & Perrings, 2013). A study in the North Carolina and Tennessee sections of the Pigeon River Watershed reported mean distances to the nearest golf course were 13,117 feet and 16,879 feet, respectively. Average premiums were very small. They were significant in the North Carolina sample but not in the Tennessee sample (Cho, Roberts, & Kim, 2011).

In each of these cases, the average premiums ostensibly suggest all golf courses in the study area have minimal impact on property values. Clearly, that is an inappropriate conclusion. It is reflective of a failure to recognize that frontage premiums of courses are likely to be substantial, but these are "washed out" when they are inap-

propriately averaged with properties distant from courses that are unlikely to have any golf premiums.

Managerial and Research Insights from the Review

Although the sample of 21 analyses is relatively sparse, the review offered eight major insights. First, the decline in premiums from frontage properties to properties that lacked a view of the course was substantial. It was much more severe than is associated with parks (Crompton & Nicholls, 2019), because non-players usually do not have access, and activities such as walking, jogging, sitting, or daydreaming usually are aggressively discouraged.

Second, with only one exception, all studies in the review treated "frontage" as a homogeneous variable. This is over-simplistic. The exception reported the average premium for vacant "ordinary" fairway lots was 42%, whereas for "prime" fairway lots with extended views (e.g., 180°, 270°) or prized views (e.g., water features or greens) the premium was 85% (Wyman & Sperry, 2010). Future studies should incorporate this distinction.

Third, Grudnitski's (2003) findings suggested it is inappropriate to treat golf courses as a homogeneous variable. It seems reasonable to anticipate that quality of courses, and hence premiums, will increase with their level of exclusivity. Thus, he reported premiums were lowest for municipal (5.7%) and semi-private courses (6%), and highest (12.5%) for private courses. He speculated this reflected differences in the quality/exclusivity of the courses and their prestige/image. A later more comprehensive study generally supported the notion of public courses having a lower premium than developer-owned private courses. There was an exception, however, since private equity courses, which required membership and were owned either by the players or a homeowner association, showed a frontage premium that was lower than municipal courses (Shultz & Schmitz, 2009). They suggested, "golf course home buyers prefer to not be part owners of those golf courses that they view and/or play" (p. 77). This may reflect concern that the decline in golf participation may result in an ever-smaller number of players being responsible for the costs of operating courses so fees become unacceptably onerous.

Fourth, vacant lot premium percentages are likely to be in the 40%-70% range in resort areas. It seems likely they will be lower in non-resort areas (perhaps 20%-40%), but invariably will be much higher than those of developed lots. Since the cost of building a given house in a community is likely to be approximately the same irrespective of where it is located, premiums are largely a function of location. Thus, when a constant house cost is superimposed on two different lot values, the percentage difference between the properties declines.

Fifth, premiums in three of the four single course studies reviewed were substantially larger, than were those reported in multiple-course studies. If all else is equal, it seems likely that single course analyses provide a more accurate picture of premiums, because studies that incorporate multiple golf courses report an average premium across all of them. By definition, the use of an average measure hides variations both above and below the average. However, in this review all else was not equal. One of the two studies had a limited number of variables in the models which could have caused "omitted variable bias." That is, the golf premiums may have been highly correlated

with variables not included in the models, resulting in some value being falsely attributed to the golf course when it really belonged to a somewhat related but different variable that was not included in the model. Nevertheless, the remaining study reporting a 26% premium. It was peer reviewed and had a comprehensive set of explanatory variables, and suggests the magnitude of frontage premium that single course analyses may reveal (Nicholls & Crompton, 2007).

Sixth, most of the recent analyses included golf courses as one of multiple amenities in mega studies undertaken across expansive regional areas. Reporting a premium for golf with a single mean value is inappropriate, because it hides wide variations. An urban housing market consists of multiple sub-markets with different sub-cultural characteristics in terms of income, lot size, level of urbanization, different types of housing, ethnic diversity et al. Treating a large geographical area as a single community results in regression-to-the-mean values, since negative and positive responses in different areas counter-balance. If a golf course premium was low, it is not necessarily evidence that all golf courses in the region had no substantive impact on property values. Rather, it is possible the impact was more localized than could be detected in a large mega study.

A seventh finding was studies incorporating multiple golf courses that measured the distance of all properties in the sample to the nearest golf course, typically reported low premiums. This reflected the inappropriateness of the measure, since this all-inclusive approach invariably meant many properties in the analyses were located many miles from a golf course. It seems improbable those owners would pay a golf premium, since most of the premium for golf accrues to properties adjacent to fairways. The low average premium resulting from the aggregation of fairway properties with those located several miles away that likely had a zero golf premium is likely to mislead rather than inform.

Finally, no study considered the likelihood of different premiums being associated with different course configurations. It seems likely that small premiums would be associated with long-established core courses constructed by municipalities or private clubs to provide opportunities for golfers to play the game without regard for their impact on real estate. In contrast, premiums inspired by Sea Pines that intentionally threaded a course around real estate and designed it to appeal to large numbers of non-golfers by creating green viewscapes are likely to be relatively high.

The number of analyses reported in the scientific literature is surprisingly small. Nevertheless, the review offers benchmarks and the "state of the art" at this time. It provides information and offers insights that can inform the decisions of public policy makers, managers, planners, appraisers, mortgage lenders, developers and homeowners. While some developers may have guidelines based on their experience for establishing premiums associated with golf course properties, other stakeholders lack information on whether a particular home purchase is likely to be a sound investment or a costly consumption choice reflecting the uniformed instincts of an individual homeowner. The consistent decline in golf participation and the associated threat of course closures has enhanced the relevance of empirical data. Increasing numbers of home owner associations, member-owned clubs, and developers who have retained responsibility for operating courses, seek such data to inform decisions relating to the impacts of closures and/or alternative strategies for future use of former golf course land.

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