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Abstract

Facilities with golf courses in California enable people to golf, play other sports, dine out, and participate in other social activities. People spent \$4.350 billion in 2000 at these facilities. These expenditures included \$1.679 billion in golf membership dues, green fees, car fees, and related charges, \$963 million for food and beverages, \$797 million for lodging, and \$250 million for merchandise from on-site golf shops. Golfers played 39.5 million 18-hole equivalent rounds in 2000. Net of imports, expenditures at these facilities represented \$4.251 billion of sales to final demand in the same year. These 'direct' sales became \$2.464 billion in personal income to Californians. The total sales, income, and tax impacts on the state economy were \$7.872 billion, \$4.546 billion, and \$1.370 billion in 2000. Direct sales of \$4.251 billion directly supported 62,173 jobs and, through indirect and induced sales impacts, an additional 37,609 jobs. Facilities and the golf courses therein covered 139,290 and 116,129 acres. Superintendents used 363,511 acre-feet of water to irrigate 86,068 acres. They spent \$824 million and worked the equivalent of 13,799 full-time equivalent jobs to care for these horticultural landscapes. Notwithstanding the degree of data comparability between this and a previous study, real spending on golf course maintenance increased 0.8% annually and the number of jobs associated with this maintenance increased 0.5% per year during 1995-2000. Revenues per acre-foot of applied water and per acre of land were, on average, 8.1 and 6.7 times larger at golf courses than traditional crop farms. The direct sales and jobs impacts in California were almost identical to those in Florida. The total value-added impact accounted for 0.4% of the California's gross state product in 2000. Our estimates are conservative because they do not include off-site expenditures of golf tourists, investment in new facilities or new course at existing facilities, or passive impacts of golf courses on mortgages and property taxes for nearby residences.

Economic Impacts of Golf Course Facilities in California in 2000

Introduction

Golf is a type of nature-based, outdoor recreation that has grown in popularity during the past fifty years. The number of players in the U.S. increased approximately 4.3% annually, from 3.5 million in 1950 to 26.4 million in 1998 (NGF-McKinsey 1999). The number of golf course facilities increased approximately 2.5% annually, from 4,324 in 1950 to 14,723 in 1998 (Moore 2001). The rate of growth of facilities in California was approximately 3.6%, which was even higher during the same period (Moore 2001). As the numbers of golfers and golf course facilities have grown, so have the economic impacts of the industry. For example, inflation-adjusted revenues in the U.S. from green fees and the sale of golf equipment increased an estimated 6.7% per year between 1986 and 1997 (NGF-McKinsey 1999). However, this same growth has intensified the competition between the golf industry, other 'urban' interests, and commercial agricultural producers for scarce land and water. As a result, reliable information about economic impacts of golf course facilities has become more important for assessing land-use or regulatory changes, comparing natural resource-using industries, and establishing priorities for golf course management.

These economic impacts were estimated for the whole U.S. in 1989 (FXM Associates 1992) and some key markets, such as Arizona in 1987 (Barkley and Simmons 1989), Florida in 1991 (Hodges et al. 1994, 64-77) and 2000 (Haydu and Hodges 2002), Southern California in 1993 (NGF-FXM Associates 1994), and South Carolina in 1994 (Barkley et al. 1995). However, no estimation or analysis of these impacts has been conducted for the entire state of California, one of the nation's most important golf markets. Except for Haydu and Hodges (2002) researchers have not estimated standard deviations of these impacts. Also, there has been no analysis of

differences in mean impacts of various types of golf course facilities. The purpose of this study was to estimate and analyze economic impacts of golf course facilities in California in 2000.

Facility Characteristics

Estimation and analysis of these impacts require census information on the exact number of facilities, the number of holes for each course at a facility, the course's length and associated par, and the type of access to these courses. In general, a golf course facility has one course or adjacent courses each with 9, 18, or 27 holes and is managed or operated by a distinct group of people who have expense budgets in common. Two courses that are not contiguous but are managed by the same organization are not part of the same facility. For example, Spyglass Hill and The Links at Spanish Bay are not adjacent and, thus, are not part of the same facility, even though the Pebble Beach Company manages them. Neither a miniature golf course nor a driving range that lacks a golf course is considered a facility. An 18-hole regulation course plays to par of 68 through 72 and should be at least 6000 yards long from its middle tees (Muirhead and Rando 1994, 66-67 and 178-179). A 9-hole regulation course is par 34 through 36 and measures at least 3000 yards long. Executive courses typically have pars of 55 through 67 for 18 holes and 28 through 33 for 9 holes (Muirhead and Rando 1994, 86). Every hole has a par of 3 strokes on a par-3 18-hole or 9-hole course.

In terms of types of facility ownership and access (Muirhead and Rando 1994, 142-149), a *private* course is open for play to dues-paying members, their guests, and, in most cases, reciprocal players who are members of other private clubs. As a rule, facilities with private courses require members to pay a type of 'two-part tariff': 1) initiation fees or deposits and annual dues in exchange for, among a number of things, 2) no charge for unlimited rounds of golf and a fee for either mandatory or optional use of a golf car. However, guests pay green fees

and reciprocal players typically pay even higher ones. A non-profit corporation in which members have an equity interest owns and operates the golf course(s) and other property of a *private equity* facility. Members of a *private non-equity* facility do not own or operate it. In rare instances, a facility might have a private course and a separate public course.

A public course is open to golfers who pay a green fee to play a round of golf. One type of public course is a *daily-fee* course, which is managed for profit and privately owned. Another type of public course is a *municipal* course, which is owned by a city, county, special district, branch of the military, other government agency, or public college or university. People who reside in the jurisdiction of the government agency that owns the municipal course often pay a green fee that is lower than the fee paid by those who do not. A municipal course can be managed to maximize revenues, net income, rounds played by residents, or rounds played by all golfers provided it covers its expenses.

A *resort* course is either the main attraction or one of the primary amenities of a hotel, inn, or other type of lodging establishment that caters to visiting golfers and other tourists (Muirhead and Rando 1994, 54-60). The course is typically managed for-profit and corporately owned. In conjunction with staying at a facility with a resort course, guests pay less for green fees than others do. The 'others' are daily-fee players and private non-equity members. Courses at facilities that provide lodging to guests of private members or other visitors but earn most of their revenue from private memberships or daily-fee play are not classified as resort courses.

We developed census-type information about all of California's golf course facilities by merging data from three different sources (NGF 2000, NCGA 2001, and SCGA-SCPGA 2001), utilizing a fourth source for incomplete or inconsistent information in the first three (Kobre 1999), eliminating duplication, and making approximately 300 phone calls to update the data and

evaluate their reliability. According to the resulting database, California had 891 facilities with golf courses that were open for play as of January 1, 2001. Twenty-four of these opened or added a course sometime in 2000. In terms of the number and length of holes, 55.3% of all facilities had one 18-hole, regulation course (Figure 1). The second, third, and fourth most prevalent types of facility had 9 holes that constituted, respectively, a regulation course (11.6 %), an executive course (8.5%), and a par-3 course (6.1%). Facilities with two 18-hole regulation courses and one 27-hole regulation course accounted for 5.0% and 3.6% of the total. Facilities with one 18-hole executive course and one 18-hole par-3 course represented 4.4% and 1.5% of all facilities (Figure 1).

In terms of access to courses and ownership, public facilities accounted for 62% of all facilities in California in 2000. In particular, facilities with nothing but daily-fee courses and those with only municipal courses represented 41% and 21% of all facilities. Clubs with private golf courses accounted for 31% of all facilities: 20% were equity clubs and 11% were non-equity clubs. Facilities with only resort courses accounted for 6% of the total. The remaining five facilities had combinations of private non-equity and resort courses, daily-fee and resort courses, and private non-equity and daily-fee courses. (See Figure 2.)

The distribution is even more complex if one classifies golf course facilities jointly by the number of holes, the length of the course, and the access and ownership (Table 1). In this case, the most common type of facility had a private, 18-hole regulation course; 22% were this type. The second most common type, 19% of all facilities, had one 18-hole, regulation daily-fee course. The third most common type, 11% of all facilities, had one 18-hole, regulation, municipal course. Thus, 30% of all facilities had one, 18-hole public course. Facilities with one 9-hole daily fee course accounted for 7% of all and were the fourth most common. The fifth

most common, 5% of facilities, had one 18-hole, executive, daily-fee course (Table 1).

Survey and Estimation Methods

We surveyed all of these golf-course facilities and followed various procedures that were recommended by Dillman (2000). In particular, a pre-notice letter with University of California at Berkeley letterhead was sent in the third week of December 2000 to the general manager of each facility in which we announced that a survey would be arriving soon, explained the nature and reasons for the survey, and mentioned industry leaders and consultants who helped us design the questionnaire. The survey contained questions about rounds, revenues, employee compensation, taxes, capital expenditures, charitable support, jobs, water use, land area, and golf-course maintenance expenses were estimated. Golf industry leaders had at least seven opportunities to suggest additions, subtractions, or rephrasing of questions. The survey and a detailed cover letter were sent in the first week and a thank-you and reminder postcard was sent in the last week of January 2001. Three golf publications (Kobre 1999, NCGA 2001, and SCGA-SCPGA 2001) were consulted and approximately 250 phone calls were made to check and update the National Golf Foundation's database of facilities (NGF 2000) with the name of the current general manager. A replacement copy of the survey and a different cover letter that was more personalized and urgent than previous letters were sent in mid-March 2001.

The survey response was 21%; managers or superintendents of 187 facilities out of 891 facilities returned surveys with usable answers to our questions. The explicit refusal rate was 8%; 70 facilities out of 891 returned the survey without any answer because of concerns about confidentiality, the length of the survey, or another unstated reason. We conducted follow-up through e-mail messages, phone calls, and letters to 76 of the facilities that responded to clarify inconsistencies in their responses and request answers to unanswered questions. The response

rate to a similar survey was 17% in Florida, where researchers mailed their survey twice and also sent a reminder postcard (Haydu and Hodges 2002, 4).

To reduce potential aggregation bias, we grouped sample information into types of facilities with the following number, length, and access-ownership of holes: 1) 9 non-regulation holes, 2) 9 regulation holes, 3) 18 non-regulation holes, 4) 18 municipal, regulation holes, 5) 18 daily-fee, regulation holes, 6) 18 private, regulation holes, 7) 18 resort, regulation holes, 8) 27 non-resort holes, and 9) 36 non-resort holes. Private, municipal, daily-fee, and resort facilities with an 18-hole regulation course accounted for 26.2%, 18.2%, 15.0%, and 1.6% of respondents (Figure 3). Facilities with one 9-hole non-regulation and those with one 9-hole regulation course represented 10.7% and 9.6% of respondents (Figure 3). Non-resort facilities with 36 holes, 27 holes, and 18 non-regulation holes accounted for 8.0%, 5.3%, and 4.3% of respondents (Figure 3).

To estimate an economic impact, we multiplied the sample mean impact of one of these nine types of facility by the number of facilities of that type. In formal terms, an unbiased, mean-based estimator of revenues, jobs, or other direct economic impact of the j th type of facility is $\hat{Y}_j = N_j \bar{y}_j$, in which N_j represents the number of facilities of type j , \bar{y}_j is the sample mean for facilities of type j , and the index j corresponds to each of the nine types of facility (Cochran 1977, 34-35). An unbiased estimator of the variance of this estimator is

$$\hat{v}(\hat{Y}_j) = N_j^2 \frac{s_j^2 (N_j - n_j)}{n_j N_j}, \text{ in which the sample standard deviation is } s_j^2 \equiv \sum_{i=1}^{n_j} \frac{(y_{ij} - \bar{y}_j)^2}{n_j - 1}, n_j \text{ is the}$$

sample size for the j th type of facility, and $\frac{(N_j - n_j)}{N_j}$ is the finite, sub-population correction

(Cochran 1977, 26 and 142-143). We used the square root of $\hat{v}(\hat{Y}_j)$ to estimate the standard deviation of the estimator of the sub-population total.

However, 13 types of facilities, which accounted for 25 facilities, or 2.8% of all, did not respond to our survey. Their direct economic impacts were estimated with auxiliary data. In particular, the economic impacts of a resort with 27, 36, or 54 regulation holes were estimated as 1.5, 2.0, or 3.0 times the average economic impacts of a resort with 18 regulation holes. A resort with one par-3 and one executive 18-hole course and a resort with one executive and one regulation 18-hole course were assumed to generate impacts that were 1.25 times and 1.75 times the impacts of a resort with an 18-hole regulation course. The economic impacts of the facility with an 18-hole regulation, resort course and a 9-hole par-3, daily-fee course were assumed to equal the sum of the impacts of a resort with an 18-hole regulation course and a non-resort with a 9-hole, par-3 course. The economic impacts of a particular 36-hole facility were assumed to equal the sum of the impacts of a facility with an 18-hole regulation, daily fee course and a resort with one 18-hole regulation course. The economic impacts of a particular 54-hole facility were estimated as the sum of the impacts of a private club with an 18-hole regulation course and a resort with two 18-hole regulation courses. The economic impacts of a facility that opened during 2000 were, by assumption, 0.5 times the average impacts of a facility of the same type that operated during the entire year.

In formal terms, the economic impact of the k th type of facility for which survey data do not exist is $\hat{Y}_k = \sum_{j=1}^9 N_k m_{kj} \bar{y}_j$. In this formula, N_k is the number of facilities of type k and m_{kj} is the assumed multiple by which average economic impacts of facilities of type k differ from the average impacts of facilities of type j . As discussed above, m_{kj} equals 0.5, 1, 1.25, 1.5, 1.75, 2, 2.5, or 3 for one or two types of facility that, on average, multiplicatively resemble facility of type k and zero for the other seven or eight types.

To estimate an economic impact of all golf course facilities in the state, we summed the

estimated impacts of each type of facility. In formal terms,

$$\hat{Y} = \sum_{j=1}^9 \hat{Y}_j + \sum_{k=1}^{13} \hat{Y}_k = \sum_{j=1}^9 N_j \bar{y}_j + \sum_{k=1}^{13} \sum_{j=1}^9 N_k m_{kj} \bar{y}_j = \sum_{j=1}^9 (N_j + \sum_{k=1}^{13} N_k m_{kj}) \bar{y}_j .$$

The estimator of the variance of \hat{Y} that was used for this study is

$$\hat{v}(\hat{Y}) = \sum_{j=1}^9 (N_j + \sum_{k=1}^{13} N_k m_{kj})^2 \hat{v}(\bar{y}_j) = \sum_{j=1}^9 (N_j + \sum_{k=1}^{13} N_k m_{kj})^2 \frac{s_j^2}{n_j} \frac{(N_j - n_j)}{N_j} .$$

If the assumed values of m_{kj} are correct, \hat{Y} and $\hat{v}(\hat{Y})$ are unbiased estimators.

To analyze differences between means for facilities of type j and $-j$ (read ‘not j ’), we assume that the variable of interest, e.g., revenue, is normally distributed over time and the sub-population variances are equal. Thus, under $H_0 : \underline{m}_j \leq \underline{m}_{-j}$, the test statistic

$$\frac{\underline{m}_j - \underline{m}_{-j}}{s \sqrt{\frac{1}{n_j} + \frac{1}{n_{-j}}}}, \text{ in which } s = \sqrt{\frac{(n_j - 1)s_j^2 + (n_{-j} - 1)s_{-j}^2}{(n_j + n_{-j} - 2)}} ,$$

has a Student’s t distribution with $n_j + n_{-j} - 2$ degrees of freedom (Johnson and Tsui 1998, 411-417). The p -values reported below are probabilities that the Student’s t would take values that exceed the calculated values of the test statistics in repeated samples.

Revenues

People spent \$4.350 billion to play golf, dine out, stay over, acquire merchandise, play other sports, and participate in other activities at golf course facilities. Revenues per facility tend to increase as the number of holes, length of the course(s), and the difficulty of access to an 18-hole regulation course increase (Table 2). In particular, revenues of non-resort facilities with 36 holes are greater, on average, than 4/3 the revenues of non-resort facilities with 27 holes (p -value = .022) and twice the revenues of non-resort facilities with 18 holes (p -value = .052). Non-resorts

with 27 holes do not generate more revenues, on average, than non-resorts with 18 holes do (p -value = .110). Resorts with 18 regulation holes generate, on average, more than six times the revenues that non-resorts with 18 regulation holes do (p -value = .000). Revenues of private clubs with an 18-hole regulation course exceed, on average, those of facilities with a regulation, 18-hole course that is daily-fee (p -value = .029) or municipal (p -value = .009). Facilities with a daily-fee, regulation 18-hole course do not generate more revenues, on average, than facilities with a municipal, regulation 18-hole course (p -value = .418). Revenues of non-resorts with an 18-hole course are greater, on average, than twice the revenues of facilities with a 9-hole course (p -value = .000). Facilities with a 9-hole regulation course do not generate more revenues, on average, than facilities with a 9-hole non-regulation course (p -value = .223).

Membership Dues, Green Fees, Golf Car Fees, Reservation Fees, and Related Charges

Golfers pay membership dues, green fees, advanced booking fees, or some combination of these to have access to the golf course for play. If golfers do not carry their own clubs, they pay mandatory or optional fees to use golf cars or pull carts, pay annual 'trail' fees to use their own cars, or, in now rare cases, hire caddies to carry them. In total, golfers paid \$1.679 billion (s.e. = \$75.4 million) in 2000 to play golf—to use courses and transport themselves, their clubs, or both around courses (Table 3). Private golf-related membership dues were \$478 million (se = \$45.1 million) of this total. Revenues from the rental of golf cars, pull carts, and caddy services and payments of trail fees were \$235 million (se = \$14.4 million) of this total. Excluded were \$78.3 million (s.e. = \$7.12 million) in driving-range fees and ball-bucket charges.

Revenues per facility increase as the number and length of holes increase (Table 3). Facilities with 36 non-resort holes generate more revenues of these types, on average, than facilities with 27 non-resort holes do (p -value = 0.029), but not 1 times more (p -value = 0.173).

Facilities with 36 non-resort holes generate more than twice the revenues of these types, on average, that facilities with 18 non-resort holes do (p -value = 0.068). Revenues to play golf are greater at facilities with 27 non-resort holes, on average, than those with 18 non-resort holes (p -value = 0.005) but not 1.5 times greater (p -value = 0.406). These revenues are also greater, on average, at non-resorts with 18 regulation holes than non-resorts with 18 non-regulation holes (p -value = 0.007). Non-resorts with 18 holes generate more than twice the amount of revenues to play golf, on average, that facilities with 9 holes do (p -value = 0.000).

18-Hole Equivalent Paid Rounds

Accurate information about rounds of golf played is important for managers and superintendents to compare their facilities to others and track trends. However, reported rounds that have not been adjusted for differences in the number of holes played (e.g., Rice 2002) make comparing and tracking difficult. To standardize our measures, we assumed that two 9-hole rounds, four twilight rounds on a 9-hole course, or two twilight rounds on an 18-hole course were the equivalent of one 18-hole round. Given these standards of conversion, golfers in 2000 played 39.5 million (se = 1.34 million) 18-hole equivalent paid rounds, which is 12% less than 45.1 million paid (se = 1.70 million) but not standardized rounds.

According to statistical evidence in Table 4, the number of 18-hole equivalent rounds tends to increase with the number of holes and the ease of access to a course but not the length of the course. In particular, golfers play more (p -value = 0.002), but not at least 2 times more (p -value = 0.395), 18-hole equivalent rounds, on average, at facilities with 36 non-resort holes than at courses with 18 non-resort holes. Eighteen-hole equivalent rounds are not higher, on average, at facilities with 36 holes than at facilities with 27 holes (p -value = .265). Golfers play at least 1.5 times more 18-hole equivalent rounds, on average, at facilities with 27 non-resort holes than

facilities with 18 non-resort holes (p -value = 0.045). Eighteen-hole equivalent rounds at municipal courses with 18 regulation holes exceed, on average, those at daily-fee facilities (p -value = 0.000) and private clubs (p -value = 0.000) with 18 regulation holes. Golfers play more 18-hole equivalent rounds at non-resorts with 18 holes, on average, than they play at non-resorts with 9 holes (p -value = 0.000) but not more than twice as many rounds (p -value = 0.166).

Golf Fees per 18-Hole Equivalent Round and Landscape Quality of Course(s)

Mean golf fees and landscape quality of course(s) by type of facility are presented in Table 5. Golf fees per 18-hole equivalent round at a particular facility were calculated as the sum of all dues and fees that people paid to play golf there during the 12-month reporting period divided by the number of 18-hole equivalent rounds that they played there during that year. Note that this variable includes not only green fees, which are usually higher on weekends and during the year's peak season, but also implicit green fees that members of private clubs pay and other out-of-pocket, on-site expenses to access and move on the golf course. The landscape quality of the course or courses at a facility was measured as the survey respondent's rating on a scale of 0 to 10. A '10' represented the quality of a course that was prepared for a televised PGA tournament.

According to the theory of hedonic prices, golf fees per 18-hole equivalent round should increase as the quality of the course(s) at a facility increases. The sample evidence in Table 5 and results of hypothesis testing based on this evidence are, in most cases, consistent with this argument. The reported quality of an 18-hole regulation course is higher, on average, than the reported quality of an 18-hole non-regulation course (p -value = .010) and the golf fees per 18-hole equivalent round are almost higher, in a statistical sense, at facilities with an 18-hole regulation course than at facilities with an 18-hole non-regulation course (p -value = 0.115). Golf fees per 18-hole equivalent round and the reported quality of the 18-hole regulation course are

higher if the course is private rather than daily-fee (p -value = 0.047 and p -value = 0.076). In turn, these fees and reported quality of the 18-hole regulation course are higher at daily-fee facilities than at municipal facilities (p -value = 0.000 and p -value = 0.004). Golf fees and course quality are higher at non-resorts with 18-hole courses than facilities with 9-hole courses (p -value = 0.000 and p -value = 0.000). Golf fees per 18-hole equivalent round are higher, on average, at facilities with a 9-hole regulation course than at facilities with a 9-hole non-regulation course (p -value = 0.006), but the quality of a 9-hole regulation course does not exceed, on average, the quality of a 9-hole non-regulation course (p -value = 0.322).

Horticultural Management

Horticultural management of golf courses, clubhouse grounds, and any other facility landscapes is one of the primary activities that affect the quality of people's golf experiences. Facilities in California with golf courses covered an estimated 139,290 acres (se = 9,625) in 2000. The golf courses themselves occupied an estimated 116,129 acres (se = 4,800). Golf course superintendents used 363,511 acre-feet (se = 48,416) of water to irrigate 86,068 acres (se = 2,812) of golf courses and landscapes around clubhouses in 2000. Expenses to maintain the golf course and other landscapes around the facilities were \$688 million (se = \$27.2 million) in 2000. This estimate covers wages and salaries, purchases of plant materials, pest management costs, fertilizer expenses, water charges, minor repairs of equipment, and any other expense for the care of trees, shrubs, grass, other plants, and water features on grounds around the facility. Expenditures for major equipment for golf course maintenance, installation of new irrigation systems, renovation of a significant planted area, and other landscape improvements were \$136 million (se = \$20.5 million) in 2000. In total, superintendents and their staffs spent \$824 million in 2000 for environmental horticulture on golf courses and related landscapes in California.

Average maintenance expenses per facility tend to increase with the number and length of holes at the facility and the full-cost of a round at an 18-hole regulation course (Table 6). In particular, maintenance expenses at non-resorts with 36 holes exceed those at facilities with 27 non-resort holes (p -value = .044) but not by more than 4/3 (p -value = .289). Maintenance expenses are higher at non-resorts with 27 holes than non-resorts with 18 holes (p -value = .002) but not more than 1.5 times higher (p -value = .308). Clubs with a private 18-hole regulation course spend more for golf course maintenance, on average, than facilities with an 18-hole regulation course that is either daily-fee (p -value = .083) or municipal (p -value = .049). Maintenance expenses are higher, on average, at non-resort facilities with an 18-hole regulation course than an 18-hole non-regulation course (p -value = .000). Golf course maintenance expenses are higher, on average, at non-resort facilities with 18 holes than at non-resort facilities with 9 holes (p -value = .000). Facilities with 9 regulation holes spend more for golf course maintenance, on average, than those with 9 non-regulation holes spend (p -value = .088).

Food and Beverage Revenues

People purchase food and beverages at restaurants, bars, snack counters, refreshment cart, or vending machines of golf course facilities in conjunction with playing golf or as a separate dining-drinking experience. People paid approximately \$963 million (se = \$151 million) for food and beverages in 2000. Food and beverage sales tend to increase with the number of holes of the facility, the length of the course, and full-cost of a round at an 18-hole regulation course (Table 7). In particular, facilities with 36 non-resort holes have food and beverage sales that, on average, exceed those of facilities with 27 non-resort holes (p -value = .076) but not by a factor greater than 4/3 (p -value = .244). Non-resort facilities with 36 holes have food and beverage sales that are higher, on average, than those of non-resorts with 18 holes (p -value = .001) but not

more than twice as high (p -value = .402). Facilities with 18 regulation holes have higher food and beverage sales, on average, than facilities with 18 non-regulation holes (p -value = .002). Food and beverage revenues are higher, on average, at resorts with 18 regulation holes than at non-resort facilities with 18 regulation holes (p -value = .000). Private clubs with 18 regulation holes generate food and beverage revenues that, on average, exceed the food and beverage revenues generated by daily-fee facilities (p -value = .033) and municipal facilities (p -value = .001) with 18 regulation holes. Food and beverage revenues are more than twice larger, on average, non-resorts with 18 holes than non-resorts with 9 holes (p -value = .000).

Revenues from Lodging Services

Although almost all golf course facilities provide food and beverage service, only golf resorts and a small minority of private and semi-private clubs provide on-site lodging. Although the National Golf Foundation classified 103 facilities in California as resorts, only 61 had on-site lodging. In five of those cases, the lodging served private members and their guests or resort play was a minor portion of the facility's revenues. Hence, the Golden State had 56 facilities with resort courses in 2000. Four of these 56 also had non-resort courses. Resorts with at least 18 regulation holes earned \$780.5 million (se = \$321 million). Total revenues from lodging services at resorts and clubs were \$797 million (se = \$321 million) in 2000. These revenues do not include rentals of on-site lots for recreational vehicles of golfers. Eight of the 42 facilities that did not have on-site hotels were daily fee or private clubs for RV users.

Merchandise Sales at On-Site Golf Shops

Golfers and others spent an estimated \$250 million (se = \$21.5 million) for golf clubs, balls, bags, clothing, shoes, and other merchandise at on-site golf shops in 2000. According to statistical evidence in Table 8, merchandise sales tend to increase with the number and length of

the holes at a facility and the cost of playing a round at an 18-hole regulation course. In particular, non-resort facilities with 36 holes have merchandise sales that are at least twice larger, on average, than non-resort facilities with 18 holes (p -value = .000). Merchandise sales are larger, on average, at non-resorts with 36 holes than at non-resorts with 27 holes (p -value = .101) but not by more than a factor of 1 (p -value = .138). These sales are also higher, on average, at private clubs with an 18-hole regulation course than at municipal facilities with an 18-hole regulation course (p -value = .085). Facilities with an 18-hole regulation course have larger merchandise sales, on average, than facilities with an 18-hole non-regulation course (p -value = .016). Merchandise sales at non-resorts with 18 holes are more than double, on average, those at non-resorts with 9 holes (p -value = .000). Facilities with a 9-hole regulation course have more merchandise sales than facilities with a 9-hole non-regulation course (p -value = .069).

Areas of Golf Shops and Clubhouses

Most golf course facilities have at least one golf shop that is part of or separate from at least one clubhouse. The golf shop is the place where golfers purchase lessons, repair services, and storage for clubs, in addition to merchandise. As Table 9 suggests but results of hypothesis partially indicate, the average floor space of facility's golf shop(s) tends to increase with the number of holes, the length of the course, and the cost of a round at an 18-hole regulation course. In particular, the area of the golf shop(s) at a non-resort facility with 36 holes is at least 2 times larger, on average, than the area at a facility with 18 non-resort holes (p -value = 0.049) but is not larger, on average, than the area at a non-resort facility with 27 holes (p -value = 0.117). A club with a private, 18-hole regulation course has a larger golf shop than a facility with a daily-fee, 18-hole regulation course has (p -value = 0.065). The golf shop at a non-resort with an 18-hole course is larger, on average, than the golf shop at a facility with a 9-hole course (p -value =

0.079) but not at least twice as large (p -value = .768). Moreover, 79% of the sampled 9-hole facilities had a golf shop whereas 100% of the sampled 18-hole facilities did.

In addition to possibly housing a golf shop, the clubhouse is where golfers and others can consume food and beverages, attend business meetings and other social gatherings, use locker rooms, and engage in other activities. Also, administrators and their staff usually have offices there. The area of the clubhouse(s) less the area of any golf shop at a non-resort facility with 36 holes is at least 1 as large, on average, as the net clubhouse area at a non-resort facility with 27 holes (p -value = 0.043) and at least as large, on average, as the net area at a facility with 18 non-resort holes (p -value = 0.022). A non-resort facility with an 18-hole regulation course has a larger clubhouse net of the golf shop than a non-resort facility with an 18-hole non-regulation course (p -value = .056). Clubs with a private, 18-hole, regulation course have larger net clubhouse areas, on average, than facilities with a daily-fee, 18-hole, regulation course (p -value = 0.000) and those with a municipal, 18-hole, regulation course (p -value = 0.001) have. The area of the clubhouse less the area of any golf shop at facilities with 18 non-resort holes is at least twice as large, on average, as the net area at facilities with 9 holes (p -value = 0.000). The clubhouses are larger at 9-hole regulation courses than 9-hole non-regulation courses (p -value = 0.027). Eighty-three percent of the sampled facilities with a 9-hole regulation course and 78% of the sampled facilities with a 9-hole non-regulation course had a clubhouse.

Direct Sales and Value-Added Impacts

The estimated expenditures of \$4.350 billion by patrons at California's golf course facilities directly contribute to the state's economy to the extent that these purchases represent sales of services and goods that businesses in the state produce and to the extent that these sales become wages, salaries, profits, and rents that Californians receive or indirect business taxes that

government officials collect. In more technical terms, these expenditures of \$4.350 billion gave rise to a direct sales impact, which, in turn, gave rise to a direct value-added impact. The direct value-added impact best represents the direct contribution of golf course facilities to the state's economy because it measures the pre-tax wages, salaries, profits, rents and indirect business taxes that these facilities pay to California residents or government agencies.

IMPLAN, a well-known input-output model, does not have a single sector for all facilities with golf courses because there are private and public facilities and multiple products. (IMPLAN stands for IMppact Analysis for PLANning.) To estimate the direct sales impact, we followed Barkley et al. (1995) and allocated portions of the \$4.350 billion in expenditures to various sectors of the IMPLAN model of California's economy that best represented similar revenue-generating activities. For example, we assigned the \$963 billion in expenditures on food and beverages to Sector 454, Eating and Drinking Establishments. The revenues of \$797 million from lodging were allocated to Sector 463, Hotels and Lodging Places. The \$688 million in maintenance expenses for the golf course and other landscapes represents payments for services provided by Sector 27, Landscape and Horticultural Services.

We also used expert opinion, professional judgment, and auxiliary data to decide on the extent to which capital improvements were for golf-course related machinery and equipment and the extent to which businesses in the state produced these capital goods and merchandise for golf shops. In Los Angeles County, 100% of the golf-course-related capital expenditures in 1999-2000 were for landscape installation, well refurbishment, building cart paths, and other activities that landscape professionals undertake (Duron 2001). To be conservative but with the Los Angeles County information in mind, we assumed that Sector 27 also accounted for 95% of the \$136 million in capital expenditures for golf courses and other landscapes around the facilities.

Therefore, 5% of capital expenditures for the golf course and other landscapes were, by assumption, purchases of mowers, irrigation equipment, and other turf machinery. In other words, \$6.710 million represents revenues that wholesalers, shippers, and manufacturers of turf machinery and irrigation equipment generated. Manufacturers of farm machineries other than tractors earned \$.68, shippers earned \$.03, and wholesalers had mark-ups of \$.29 of every \$1.00 in sales in the U.S. (Lawson 1997, 54). We assumed that wholesalers and shippers were located in California and received 100% of their proportionate revenues but manufacturers in the state received only 5% of the producers's share. Thus, we allocated \$1.948 million of the \$6.710 million to Sector 447, Wholesale Trade, \$.199 million to Sector 435, Trucking and Warehousing, and \$.228 million, or 5% of \$4.563 million, to Sector 309, Farm Machinery and Equipment.

The \$250 million in expenditures on merchandise created a direct impact on California's economy to the extent that businesses in the state manufactured the goods, shipped them, or did both, in addition to the golf shops retailing them. Retail activities of golf shops are most similar to those of Sector 452, Apparel and Accessory Stores, which sells clothing and shoes, and Sector 455, Miscellaneous Retail, which sells golf clubs, bags, balls, books, videos, and other paraphernalia. To allocate this \$250 million to one of these sectors or the other, we multiplied average percentages of expenditures on types of merchandise in the U.S. for five types of facilities (Table 10) by the following merchandise purchases in California at those five types: 1) \$48.3 million at facilities with an 18-hole, daily-fee, regulation course, 2) \$25.4 million at facilities with an 18-hole, municipal, regulation course, 3) \$73.6 million at clubs with an 18-hole, private, regulation course, 4) \$26.9 million at resorts with at least 18 regulation holes, and 5) \$76.2 million at all other facilities. (No information on the type-of-merchandise shares of sales at daily-fee facilities was available. Hence, these unknown percentages were assumed to equal

the shares at municipal facilities with 18 regulation holes. The percentages at all other facilities were assumed to equal the means of the percentages at daily-fee, municipal, private, and resort facilities with 18 regulation holes.) Thus, the merchandise expenditures were equivalent to \$137.5 million and \$113 million in expenditures on Sectors 452 and 455.

However, the revenues that these two sectors earn are, by definition, the portions of total expenditures that represent retail margins. In other words, these sectors earn retail mark-ups as payments for selecting, gathering, displaying, and selling merchandise. Table 10 also presents the most recent publicly available information on retailers's shares, shippers's shares, and manufacturers's shares of the final purchase prices in the U.S. for types of products that are similar to the types of merchandise at golf shops. Expenditures on each type of merchandise multiplied by the corresponding retail shares imply that Sectors 452 and 455 earned \$68.9 million and \$55.0 million in the form of mark-up revenues at on-site golf shops.

Sector 435, Motor Freight Transport and Warehousing, earned \$1.748 million by shipping merchandise to on-site golf shops in 2000. This figure equals the sum of retail expenditures on each type of merchandise times the corresponding shippers's shares of retail prices.

Sectors 176, 177, and 483--Book Publishing, Book Printing, and Motion Pictures--earned \$3.10 million for producing in California, by our assumption, 75% of the golf-related videos and books that were sold in the state's on-site golf shops. Sporting and athletic manufacturers in Sector 421 earned \$26.3 million for producing, by our assumption, 50% of the golf clubs, bags, and other supplies that on-site golf shops sold. Apparel and shoe manufacturers in Sectors 124 and 224 earned \$0.598 million for producing, by our assumption, 1% of the clothing and shoes that on-site stores sold.

Golf course facilities also earned revenues for, among other things, scheduling of tee times,

golf-car and pull-cart services, golf lessons, club repair, hosting tournaments, operation of driving ranges, use of any swimming pool, tennis courts, or other recreational venues, rental of clubhouse rooms for meetings, and administration. In providing these services, resorts and other facilities with public golf courses most closely resemble businesses that belong to Sector 488, Recreation and Amusement, whereas facilities with private courses most closely resemble businesses that belong to Sector 489, Membership Sports and Recreation Clubs. Resorts and other facilities with public courses earned \$1.158 billion (Sector 488) and facilities with private courses earned \$357 million (Sector 489) for these services in 2000. These figures equal total revenues minus expenditures for food and beverage service, golf course maintenance and course-related capital goods, lodging service, and merchandise at on-site golf shops.

As a result of the allocations of expenditures to various IMPLAN sectors, the direct impact of golf course facilities on sales to final demand in California was \$4.251 billion in 2000 (Table 11). As estimated by the 1998 IMPLAN model of California's economy (MIG 2001), the direct contribution to California's economy in 2000, the direct value-added impact of these sales, was \$2.710 billion. Wages, salaries, profits, and rents were \$2.464 billion of this direct impact.

Total Sales and Value-Added Impacts

In addition to direct impacts on personal income, the direct sales impacts of \$4.251 billion also created 'indirect impacts' because the businesses that supplied good or services to the facilities purchased inputs from other businesses (e.g., Davis 1993, 53-58). These direct sales impacts created 'induced impacts' as well because Californians spent some of the income that they earned from the golf course facilities, transport firms, manufacturers, and the other companies that supplied inputs to these businesses (e.g., Davis 1993, 59-62). If these 'ripple effects' are added to the direct impacts, the total sales and value-added impacts were \$7.872

billion and \$4.986 billion in 2000. In other words, if facilities with golf courses in California had not operated in 2000 and neither the associated land, labor, nor capital had been employed elsewhere, gross sales and gross state product would have decreased by \$7.872 billion (Table 12) and \$4.986 billion (Table 13).

Jobs

How many jobs would have been lost if golf course facilities had not operated and no one found employment elsewhere? The direct loss would have been 62,173 jobs, at least 99.5% of which would have been full-time equivalent positions. That is, people worked the equivalent of 61,898 full-time jobs ($se = 8,497$) to provide services at golf course facilities in California and 275 other jobs, not necessarily full time, to manufacture and ship the merchandise that was sold at on-site golf shops and the capital goods that were purchased (Table 14). The estimate of 275 jobs comes from the IMPLAN model. This model also estimates 37,609 jobs associated with indirect and induced sales. Hence, the total loss would have been 99,782 jobs (Table 14).

People who acquire, prepare, serve, and clean up food and beverages work for the facility and its owners, a management company, or an independent concessionaire. Food-and-beverage service entails one or more of the following positions: food and beverage manager, maitre'd, host or hostess, head server, servers, wine stewards, bus person, bar manager, head bartender, bartenders, executive chef, chefs, cooks, kitchen workers, dishwashers, porters, snack-bar attendant, and others. In 2000, people worked the equivalent of 21,610 full-time jobs ($se = 3,855$) to provide food and beverage service (Sector 454 in Table 14 and Table 15).

Horticultural management at a golf course facility entails numerous jobs, some of which are highly skilled and require periodic certification. These positions include golf course superintendent, assistant superintendent(s), head mechanic, assistant mechanic(s), foreman or

forewoman, spray technician(s), head gardener, gardener(s), irrigation specialist(s), and grounds crews. In total, superintendents and their staffs worked the equivalent of 13,799 full-time jobs (se = 479) to care for golf course landscapes in 2000 (Sector 27 in Table 14 and Table 16).

The golf shop is the focal point of golf-related transactions. In addition to purchasing merchandise, golfers typically pay their green fees, car or pull-cart fees, and driving-range ball-bucket charges there. Golfers also pay for club rental, club repair, and lessons at the golf shop. Jobs to provide these services include the following: head golf professional, professional assistants, shop manager, car fleet manager, assistant managers, buyer, car maintenance supervisor, golf car mechanic(s), car or range attendant(s), caddies, and marshals. In total, Californians worked the equivalent of 10,532 full-time equivalent jobs (se = 601) at on-site golf shops in 2000 (Table 17). This estimate of total FTE jobs at golf shops multiplied by the ratio of IMPLAN-predicted 'direct' jobs for Sector 452 to IMPLAN-predicted 'direct' jobs in that sector and Sector 455 equals 5,297 FTE jobs in that sector and, by a similar procedure, 5,235 FTE jobs in Sector 455 (Table 14).

The remaining 15,956 full-time equivalent jobs at golf course facilities—61,898 minus the 45,942 FTE jobs that are discussed above—were for other activities, such as lodging services, exercise and recreation other than golf, and administration. Sectors 463, 488, and 489 in the IMPLAN model are relevant. This remainder multiplied by the ratio of IMPLAN-predicted 'direct' jobs in each of these three sectors to the total IMPLAN-predicted 'direct' jobs in all of these sectors equals our estimates of FTE jobs in each sector (Table 14).

According to statistical evidence in Tables 15-18, the number of FTE jobs usually increases proportionately more than the number of holes increases. In particular, non-resorts with 36 holes have at least 1 times more full-time equivalent jobs than non-resorts with 27 holes in total (*p*-

value = .006), golf course maintenance (p -value = .009), golf shop operations (p -value = .028), administration (p -value = .047), and jobs other than those in food and beverage service (p -value = .056). Non-resorts with 36 holes have more than 2 times the number of FTE jobs in the golf shop (p -value = .000) and more than 1.75 times the number of FTE jobs in total (p -value = .029) and golf course maintenance (p -value = .040) as non-resorts with 18 holes have. There are at least 2 times the number of FTE jobs in total (p -value = .000), golf course maintenance (p -value = .000), food and beverage service (p -value = .000), golf shop operations (p -value = .004), administration (p -value = .000), and all other services (p -value = .001) at non-resort facilities with 18 holes as there are at non-resort facilities with 9 holes.

The number of jobs also tends to increase with the length of the 18-hole course and the cost to play it. For example, non-resorts with an 18-hole regulation course have more FTE jobs in total (p -value = .013), golf course maintenance (p -value = .047), food and beverage service (p -value = .036), golf shop operations (p -value = .052), other non-administrative services (p -value = .086), but not administration (p -value = .413), than non-resorts with an 18-hole par-3 or executive course have. Not surprisingly, people work, on average, more full-time equivalent jobs in total (p -value = .000), golf course maintenance (p -value = .089), food and beverage service (p -value = .000), golf shop operations (p -value = .000), administration (p -value = .000), and other non-administrative services (p -value = .000) at resorts with 18 regulation holes than non-resorts with 18 regulation holes (p -value = .000). Clubs with one 18-hole, regulation, private course have, on average, more FTE jobs in total (p -value = .004), golf course maintenance (p -value = .027), food and beverage service (p -value = .001), golf shop operations (p -value = .069), other non-administrative services (p -value = .011), and administration (p -value = .001) than facilities with one such daily-fee course have. In turn, there are more full-time

equivalent jobs in total (p -value = 0.014), golf course maintenance (p -value = 0.054), food and beverage service (p -value = 0.031), other non-administrative services (p -value = .043), and administration (p -value = .005) but not golf shop operations (p -value = 0.204) at facilities with a regulation, 18-hole, daily-fee course, on average, than at facilities with such a municipal course.

Employee Compensation

People who manage and operate golf course facilities create economic value. People in these jobs earned \$1.370 billion (se = \$196 million) in pre-tax wages, salaries, and benefits in 2000. According to the IMPLAN model and direct sales of \$4.251 billion, employees earned \$1.507 billion not only for producing services at the golf course facilities but also for manufacturing and shipping merchandise for on-site golf shops and capital goods (Table 19). If golf course facilities in California had not existed and none of the employees had jobs elsewhere, the total decline in employee compensation would have been \$2.686 billion (Table 19).

According to statistical evidence in Table 20, total employee compensation increases but usually not in proportionate manner with the number of holes, the length of a course, and the difficulty of access to an 18-hole course. In particular, total employee compensation is higher, on average, at 36-hole non-resort facilities than 27-hole non-resort facilities (p -value = .061) but not 4/3 times higher (p -value = .154). Total employee compensation is higher, on average, at 36-hole non-resort facilities than 18-hole non-resort facilities (p -value = .000) but not 2 times higher (p -value = .207). Resorts with 18-hole regulation courses have higher employee expenses than other facilities with 18-hole regulation courses (p -value = .000). Private clubs with 18-hole regulation courses spend, on average, more in total employee wages, salaries, and benefits than daily-fee (p -value = .003) and municipal (p -value = .000) facilities with 18-hole regulation courses. The likely reason for this excess is that the private clubs have more FTE jobs. Daily-

fee facilities with an 18-hole regulation course have larger employee expenses, on average, than municipal facilities with an 18-hole regulation course (p -value = .010). Municipal facilities are more likely to contract out all or parts of the services provided and, in all likelihood, reported the compensation paid to in-house employees. Total employee compensation is higher, on average, at non-resort facilities with an 18-hole regulation course than non-resorts with an 18-hole non-regulation course (p -value = .013). Also, facilities with an 18-hole course spend, on average, more in total wages, salaries, and benefits than facilities with a 9-hole course (p -value = .000). Pre-tax employee compensation is not higher, on average, at facilities with 9 regulation holes than 9 non-regulation holes (p -value = .753).

Taxes

In addition to generating revenues that become income, people who work at golf course facilities and businesses that are linked to them also add value to an economy by generating revenues from which 'indirect' business taxes are paid. Examples of these taxes are excise, sales and property taxes (Olson 1999). According to the IMPLAN model, golf course facilities paid \$245 million in indirect business taxes from its direct sales of \$4.251 billion and, through indirect and induced sales impacts, generated an additional \$196 million in indirect business taxes (Table 21). In other words, \$441 million of the \$4.986 value that golf course facilities added to California's gross state product represented indirect business taxes.

Of course, golf course facilities, linked businesses, and people who obtain income from them also pay social insurance contributions, income taxes, other taxes, and dividends to government agencies. According to the IMPLAN model, golf course facilities paid dividends and generated corporate, personal, and social insurance taxes of \$143 million to state and local governments and \$786.5 million to the federal government (Table 21). Thus, if golf course facilities had not

existed in 2000, tax revenues to all levels of government would have been \$1.370 billion less in that year.

Support for Charities

Golf course facilities host tournaments that support charities. Although some of these tournaments are well known, hundreds are not but still raise significant amounts of money for the community. All total, golf course facilities in the state generated \$68.5 million (se = \$22.1 million) for all charities. California-based charities received an estimated \$39.7 million (se = \$6.51 million). Both of these estimates include \$4.00 million in charitable contributions from the AT&T Pebble Beach National Pro-Am (Roberts and Zambo 2000, 11).

Charitable contributions represent additional direct economic impacts if charities do not pay to use the golf courses of the hosts. In some cases, they do not pay. For example, facilities donated 338,705 rounds (se = 82,497) in 2000 for charitable tournaments. If valued at the average fees to play golf, these rounds represented forgone revenues of \$18.3 million (se = \$8.09 million). In other cases, however, charities did reimburse facilities for lost green fees, expenses, or both. Thus, the estimate of \$39.7 million should be reduced by the amount that charities paid to hosts to reimburse lost green fees and expenses. Our survey did not contain a question about revenues, if any, that facilities earned to host charitable tournaments.

According to results of hypothesis tests based on sample evidence in Table 22, non-resort facilities with 36 holes generate charitable contributions for all charities and California charities that, on average, exceed (p -value = .010) and are more than twice as large as (p -value = .028) the corresponding contributions that non-resort facilities with 18 holes generate. Non-resort facilities with 27 holes raise at least 1.5 times more, on average, for charities within the state than non-resort facilities with 18 holes do (p -value = .057). Resorts with 18 regulation holes generate

more revenues, on average, than other types of facilities with 18 regulation holes generate for all charities (p -value = 0.010). Facilities with an 18-hole, regulation course that is daily-fee and private generate contributions for charities within the state that, on average, exceed contributions that facilities with an 18-hole, regulation municipal course generate (p -values = .059 and .045). Contributions to all and state charities from facilities with 18 non-resort holes are, on average, more than twice the contributions from facilities with 9 holes (p -value = 0.079 and 0.050). Facilities with 9-hole regulation courses do not generate more, on average, than facilities with 9-hole non-regulation courses for all (p -value = .113) and California (p -value = .131) charities.

Passive Impacts on Residential Property Values

In addition to being the places where people actively generate economic impacts, golf courses are also places near to which some people prefer to live because they enjoy the views of managed green landscapes, ponds, and wildlife. Golf course facilities, however, are also places where people can experience greater traffic, noise, and risks of golf-related personal injury and property damage the closer they live to them. If the net effect of golf courses on housing prices is positive, then people, on average, pay higher mortgages and property taxes or higher rents and, thereby, generate bigger economic impacts than owner-occupants or renters of houses far from golf courses. Residential property values in the 18 counties studied in Florida were, on average, 23.1% higher if golf courses were near than if not (Haydu and Hodges 2002, 23-24).

Estimation of the number of houses in golf-course real estate developments and around all other golf courses in California, the distance of these houses to the nearest golf course, the market prices of these houses, and the premia that people paid or the discounts that they received because they lived near golf courses was beyond the scope of this research project. However, we can speculate. One hundred eighty three of California's 891 golf course facilities in 2000 were

integral parts, if not the focal points, of real estate developments. Suppose these developments had, on average, 100 houses that for property tax and mortgage purposes were valued at \$298,153, which is 22.5% higher than the median sales price of a single-family home in the state in 2000 (DOF 2001, I-11). In addition to being close to the average premium in 18 counties of Florida, this 22.5% premium is the mean of 7.5%, which is the midpoint of the estimated range of premia for residences on golf-course frontage, and 37.5%, which is the midpoint of the reported range of premia for houses in golf course developments (Asabere and Huffman 1996, 351-352). If local governments annually collected 1% of this value in property taxes, owners paid \$10.0 million more in property taxes in 2000 because of these real estate developments. Furthermore, if owners of these 18,300 houses had 30-year mortgages at fixed annual interest rates of 7%, they paid almost \$4,413 more per house or \$80.8 million more for all these houses in mortgage payments in 2000. In total, if these assumptions are correct or conservative, California real estate developments around golf courses generated \$90.8 million in higher mortgage payments and property taxes in 2000.

Economic Impacts of Golf and Off-Site Expenditures of Golf Tourists

Economic impacts of golf course facilities are not the same as the economic impacts of golf. On the one hand, people engage in athletic and recreational activities other than golf at these facilities. People paid \$37.6 million (se = \$7.30 million) for non-golf memberships at private clubs or daily-fee facilities and \$38.3 million (se = \$28.3 million) in fees to play sports other than golf. These non-golf expenditures represented 4% of all expenditures to engage in athletic activities. In other words, 96% of expenditures for athletic activities at golf course facilities were for golf. On the other hand, economic impacts of facilities with golf courses do not include the economic impacts of stand-alone driving ranges, pitch-and-putt and miniature courses, or off-

site retailers who sell golf merchandise. The latter impacts are part of the impacts of golf.

To the extent that tourists traveled to or within California to play golf, their expenditures within the state but away from golf course facilities for lodging, food, in-state transportation, entertainment, and other services and goods in 2000 would have added to the direct impacts of golf. Our estimate of direct impacts of facilities with golf courses does not include these expenditures for two reasons. First, direct impacts are, by our definition, generated on-site whether or not they are attributable to golf. Second, if one defines direct impacts more broadly, one must make numerous arbitrary assumptions to estimate with available data how much total expenditure of tourists should be attributable to playing golf.

How large might those expenditures have been? California had 3.578 million overseas visitors whose main purpose for travel was leisure (CIC Research, Inc. 2001, 51). A vacation was the main purpose of 83.2% of these leisure visitors and 5.7% played golf, tennis, or both (CIC Research, Inc. 2001, 54 and 56). If each percentage were independent of the other, 75% of the 5.7% actually played golf in California, and 80% of those who played golf did so as their primary reason for visiting the state, then there would have been 101,810 golf-as-the-main-purpose trips from overseas leisure visitors in 2000. Overseas leisure visitors to California spent, on average, \$92 per day per person trip and 9.8 nights per trip in the state (CIC Research, Inc. 2001, 80). If these averages were also those for the sub-population of tourists who took golf-as-the-main-purpose trips and if the average number of days that leisure visitors spent per trip equaled the average number of nights, then the estimated expenditures on- and off-site of overseas golf tourists in 2000 were \$91.8 million.

Leisure tourists from California and other states in the U.S. made 178.7 million and 30.5 million trips to the Golden State in 2000 and played golf during 4.817 million and 1.00 million

of them (DK Shifflet and Associates Ltd. 2001, 1 and 45). Resident and non-resident leisure tourists stayed 1.8 and 4.3 days per trip and spent \$85.60 and \$83.38 per day, on average, in that same year (DK Shifflet and Associates Ltd. 2001, 63 and 67). (The average of \$83.38 includes one-fourth of \$38.30, the average daily spending on transportation, the remainder of which we assume occurred in the state of origin.) Assume that 80% of the leisure tourists who played golf did so in California as their primary purpose for travel. Also assume that average lengths of stay and daily expenditures of resident and non-resident leisure tourists were the same as the averages of the sub-populations of resident and non-resident golf-as-primary-purpose tourists. Then expenditures of these respective groups were \$593.8 million and \$286.8 million in 2000.

All total, if these assumptions are accurate or at least error on the side of caution, leisure tourists whose primary purpose of travel to or within California was to play golf spent \$972.4 million in the Golden State in 2000. How much of these expenditures did they make off-site and how much of these expenditures were on-site and, thus, already counted in our estimate of direct economic impacts? This question cannot be answered without additional information and assumptions. According to responses to one of our survey questions, out-of-state visitors spent \$850.6 million (se = \$479 million), or 20% of \$4.350 billion, at California's golf course facilities in 2000. Assume, as we believe, that this figure actually represents spending of non-local visitors. The on-site expenditures of golf-as-primary purpose-of-travel tourists account for a fraction of \$850.6 million by non-local visitors who played golf. Although our survey data do not enable us to directly estimate that fraction, \$972.4 million accounts for 55.4% of estimated spending of people who traveled to or within California and played golf during their trip in 2000 (CIC Research, Inc. 2001, 14, 40, 54, 56, and 80; DK Shifflet and Associates Ltd. 2001, 1, 45, 63, and 67). Assume that the ratio of on-site expenditures of golf-as-primary-purpose-of-travel

tourists to on-site expenditures of these and other non-local visitors who played golf in California equals 0.554. Then, an estimated \$471.2 million of the \$850.6 million was on-site spending of golf-as-primary-purpose-of-travel tourists. Hence, \$501.2 million of \$972.4 million was off-site expenditures within California of golf-as-primary-purpose-of-travel tourists in 2000.

Finally, our estimate of economic impacts does not count investment in new courses at existing facilities or new facilities that occurred 2000. Investors were financing the addition of 117 new holes at ten existing facilities and renovation of an 18-hole course at each of two facilities by the end of 2000. Architects, builders, and their staffs were designing or constructing 32 new golf course facilities with 702 holes as of December 31, 2000.

Comparisons of Impacts

Direct economic impacts of facilities with golf courses are similar in California and Florida. Golfers and other consumers spent \$4.350 billion in California and \$4.437 billion in Florida (Haydu and Hodges 2002, 15) at golf course facilities in 2000. Golfers paid green fees, car fees, and dues other than private membership dues that totaled \$1.201 billion in California and \$1.186 billion in Florida to play golf in that year. Golfers and others spent \$963 million in California compared to \$794 million in Florida (Haydu and Hodges 2002, 16) for food and beverage service. They purchased merchandise worth \$250 million in the Golden State compared to \$267 million in the Sunshine State (Haydu and Hodges 2002, 16) at on-site golf shops in 2000. People worked 51,375 full-time jobs and 20,664 part-time or seasonal jobs in 2000 at golf course facilities in Florida (Haydu and Hodges 2002, 18). If a part-time or seasonal job were, on average, the equivalent of one-half of a full-time equivalent job, then there were 61,707 full-time equivalent jobs at these facilities. Similarly, people worked at least 61,898 and at most 62,173 full-time equivalent jobs at golf course facilities in California in the same year.

Differences exist, however. Florida had 1,334 facilities with golf courses in 2000, or 49.7% more than California had. Superintendents spent \$1.056 billion for golf course maintenance in the Sunshine State, 53.5% more than they spent for maintenance in the Golden State. Revenues from lodging services in Florida were \$164 million, which were 79% less than those revenues in California. If the percentages of 9-hole and twilight rounds played were the same in Florida and the rest of the U.S. as they were in California, one can reasonably compare paid rounds of 45.1 million in the Golden State to 58.6 million in the Sunshine State (Haydu and Hodges 2002, 12) and 518.1 million for the U.S. (Rice 2002). Similar total revenues, slightly larger golf-play revenues, fewer unadjusted paid rounds, and fewer facilities in the Golden State suggest that total and golf-play expenditures per paid round and per facility were higher in California than Florida.

How important are the economic impacts of golf course facilities in California relative to impacts of other industries in the state? California's amusement and recreation businesses that belonged to Group 79 of the Standard Industrial Classification accounted for \$13.291 billion, or 1%, of the gross state product in 2000 (BEA 2002). The state's arts, entertainment, and recreation establishments that belonged to Sector 71 of the North American Industry Classification System had receipts of \$15.914 billion in 1997 (DOF 2001, Q-17) and, based on 7.9% annualized growth of Group 79, an estimated \$19.965 billion in 2000. Golf course facilities belonged to both SIC's Group 79 and NAICS's Sector 71. Thus, since facilities with golf courses generated \$4.251 billion of sales to final demand and \$4.350 billion in receipts, they accounted for 32% of Group 79's sales to final demand and 22% of Sector 71's receipts in 2000. Regardless of which of the two definitions of the entertainment and recreation sector one uses, the total value-added impact of golf course facilities accounted for 0.4% of California's gross state product in 2000.

However, California's golf course facilities also belong to the state's agricultural sector because people who work there use land, water, and other inputs to cultivate turf and other plants in landscapes to create economic value. Thus, golf courses and any on-site driving ranges are types of farms. Californians paid \$1.758 billion in 2000 to play and practice golf at these farms. These 'farm-gate' revenues at golf courses were 8.8% of \$19.904 billion, the farm-gate value in 2000 of conventional agricultural commodities except apiary, dairy, livestock, and poultry products (CDFA 2001, 38-39). Golf-course area and water use were 1.3% of the 8.767 million acres of land and 1.1% of the estimated 33.324 million acre-feet of water that growers used in 2000 to produce these conventional agricultural commodities (CDFA 2001, 38-39; DWR 1998, ES4-11; NASS 2000, 253, 257-259, and 269-273). (The estimated area includes 67,800 acres for nursery products, flowers, and other horticultural specialties in 1998.) Hence, farm-gate revenues were, on average, \$15,136 per acre of land and \$4,835 per acre-foot of water at golf courses but \$2,270 per acre of land and \$597 per acre-foot of water at conventional farms. Thus, revenues per acre-foot of applied water and per acre of land were, on average, 8.1 and 6.7 times larger at golf courses than traditional crop farms. The farm-gate values per acre of land and acre-foot of water are higher for only a few conventional commodities than for the turf and other plants at golf courses (Templeton et al. 2000, 988 and Zilberman et al. 1993). The per-acre-of-land and per-acre-foot-of-water values for most agricultural commodities are one or two orders of magnitude lower because of heterogeneity of agro-climates in California and differences in market demands (CDFA 2001, 38-39 and Zilberman et al. 1993).

How much have the economic impacts of these non-conventional farms grown? This question can only be incompletely answered. The number of golf courses in California increased by 1.7% per year during 1995-2000, from 898 in 1995 (Phalen 1998) to 977 golf courses in

2000. Spending on course maintenance and landscape-related capital projects in 1995 was \$792 million (in equivalent 2000 \$s), given an annualized inflation rate in the agricultural services sector of 4.4% during 1995-2000 (BEA 2002). This estimate was based, however, on average expenses per course for the western U.S. (GCSAA 1996, 6). Golf course maintenance entailed 13,470 jobs in the same year (Templeton et al. 2000). This estimate, however, was based on the median jobs at a private 18-hole course in that year (Phalen 1998). Notwithstanding the degree of comparability between the data for 1995 estimates and 2000 estimates, real spending on golf course maintenance increased 0.8% annually during 1995-2000. The number of jobs associated with golf course maintenance increased 0.5% per year during the same period.

Future Research

Our estimates of direct impacts--\$4.986 billion of the state's gross domestic product and 62,173 jobs in 2000--are conservative. Researchers could define the direct economic impacts of golf course facilities more broadly than we did to include capital expenditures on new facilities or new courses at existing facilities, off-site expenditures of golf tourists, and premia embodied in annual mortgages and taxes for nearby residential properties. To estimate investment, researchers would need to separately survey architects and builders or the financiers. To determine how many tourists came to or traveled within California to play golf and how much they spent off-site, researchers will need to get the cooperation of state government officials and perhaps pay the consultants who are hired to track tourist behavior to add additional questions to their surveys. A study of the passive impacts of golf courses on neighboring property values is a separate project that would require, among other things, acquisition of a large database on house prices and proximities to not only to golf courses but also other open space throughout the state.

Of course, researchers could also define the direct impacts more narrowly than we did to

exclude expenditures on non-golf activities—e.g., skiing or tennis—in which people participate at golf course facilities. Also, our estimate of the direct impacts of merchandise sales is liberal by if, as one golf professional contends (Morton 2002), the retail margins at on-site golf shops actually fall in a 20%-50% range that depends on whether the stores are at resorts, private clubs, or public facilities rather than the 40%-55% range that we used. To avoid using information about personal consumption expenditures in the U.S. on various categories of goods that include the various types of golf merchandise, researchers should ask about the average retail mark-up of the survey respondent's on-site golf shop for these types of golf merchandise.

Researchers could take some additional steps to improve survey response and the overall reliability of individual facility information in the future, if time and money permit. Surveys of Coachella Valley facilities, which are primarily in the Greater Palm Springs area, should be sent in May, the beginning of their off-peak season. Surveys of municipal facilities should be sent in some cases to the Directors of Golf or Heads of the Departments of Parks and Recreation rather than the on-site managers, who in some cases are either independent concessionaires or city employees who do not have access to financial records of all of the concessionaires. Also, portions of the survey could be tailored for each type of facility. For example, a question about the total revenues of a municipal facility might be confusing because, although a Director of Golf has access to financial records, he or she thinks in terms of the city's revenues, which come from the city-run operations and rents that concessionaires pay.

The least reliable information in our study undoubtedly concerns resorts. A relatively low response was and will be unavoidable to some extent. In our experience, the bigger or more diffusely owned a company's business is relative to those of competitors, the less likely the company responds to surveys. Moreover, golf is probably not the primary source of revenue in

some resorts, for example, those run by national hotel chains that have beds well in excess of those that are used by golfers. In these cases, the survey should be sent to the Directors of Golf, not the general managers of the hotels. Separate surveys could be sent to the superintendents so that researchers at least acquire the important information about operating expenses and capital expenditures for golf course management, land areas, and water use.

Regardless of which type of facility receives the survey, some of the questions should be redesigned or simplified. For example, one of the column headings of the table in which respondents were asked to report areas of various portions of the golf course confused some of them. A few of the questions in the survey should probably be eliminated. For example, the information about seasonal, vacation or time-share, and monthly memberships helped in a few instances to classify access to a course but was not used otherwise. To estimate the impacts of the financial support of charities that golf course facilities provide, researchers should ask about reimbursement, if any, that these facilities receive to host charitable tournaments.

Conclusion

Although conservative, our results indicate that golf course facilities added almost \$5 billion in value to California's economy in 2000 and supported almost 100,000 jobs. Revenues and full-time equivalent jobs per facility increases, in many cases proportionally, as the number of holes increases. Employee compensation per facility also tends to increase as the number of holes increases but not proportionally more. Impacts are higher, on average, at facilities that charge more or have regulation courses. In addition to earning \$1.8 billion by providing people a place to play and practice golf, these facilities also sold almost \$1 billion in food and beverages, \$0.8 billion in lodging services, and \$0.25 billion in merchandise. Estimation of direct impacts by type of facility and allocation of the estimates to various sectors that correspond to the multiple

goods and services sold by these facilities are methods that should be used for future research.

Turfgrass and other plants on golf courses are one of California's highest-value 'crops' in terms of either revenues per acre of land or acre-foot of water. State government allocates water to agricultural water districts, private businesses, public utilities, and other organizations.

Government allocation of water away from low-value uses to golf courses and other high-value uses could enable those who gain the water to compensate those who do not for their losses and still be better off than they would have been without the reallocation. Establishment of water markets could enable people to voluntarily make these reallocations. As farmers of high-value landscapes, golf course superintendents would buy water from farmers of low-value crops.

Researchers and policy makers have begun to use these results. Consultants at the Stanford Research Institute requested the estimates from this and other state-level studies to determine the contribution of golf course facilities to gross domestic product of the nation. An official in the California's Department of Water Resources has requested our census information about the number of various types of facilities and our sample information about the average landscape area of these facility types to better estimate stateside water use in 2000. Also, officials in the California Travel and Tourism Commission have begun to market the state's golf courses.

According to our results and the assumptions of this regional input-output model, if tourists were to spend an extra \$1 million at facilities that permitted daily-fee play and if average costs of producing extra golf goods and services were to stay constant, then this marketing campaign would also generate \$977,000 in direct sales to final demand, add \$1.146 million in value to the gross state product, and support 23 new jobs in the state.

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Figure 1: Distribution of 891 Facilities by Number and Length of Holes

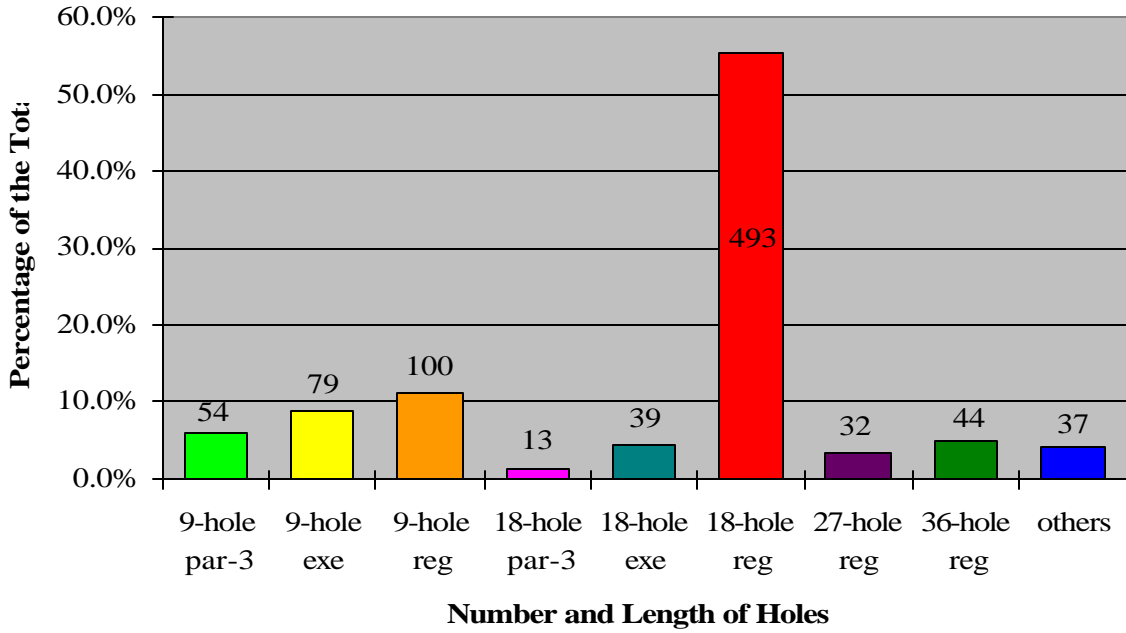


Figure 2: Distribution of 891 Facilities by Access and Ownership

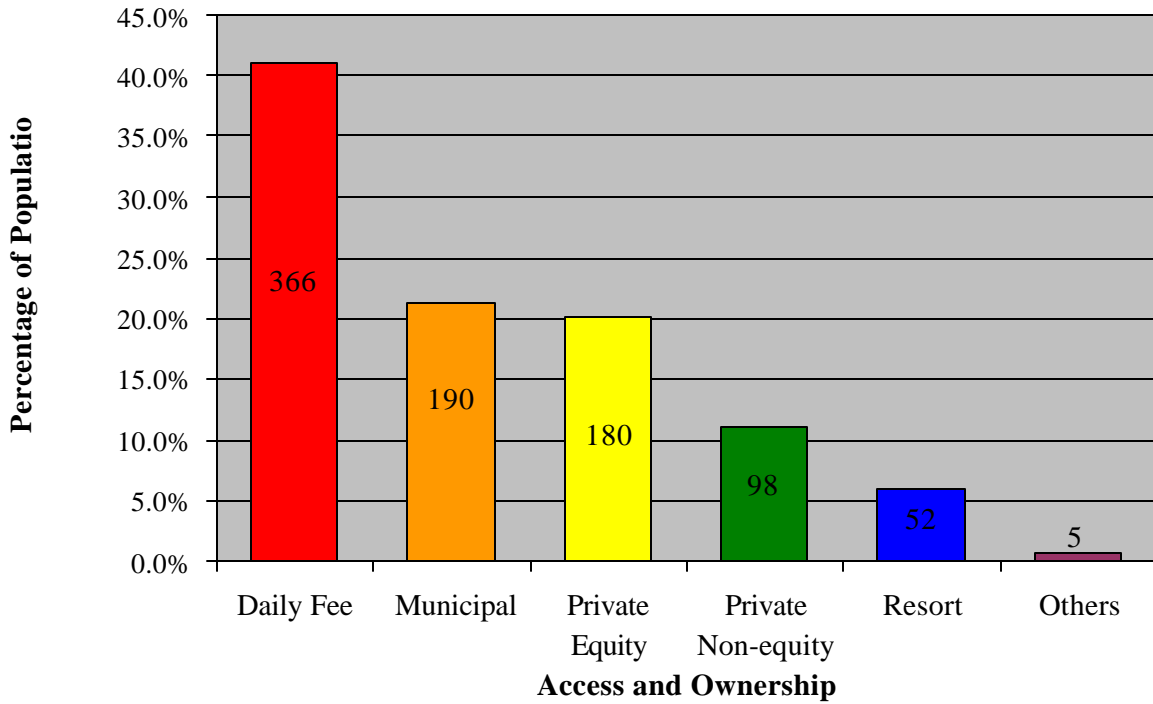


Figure 3: Distribution of Survey Respondents by Type of Facility

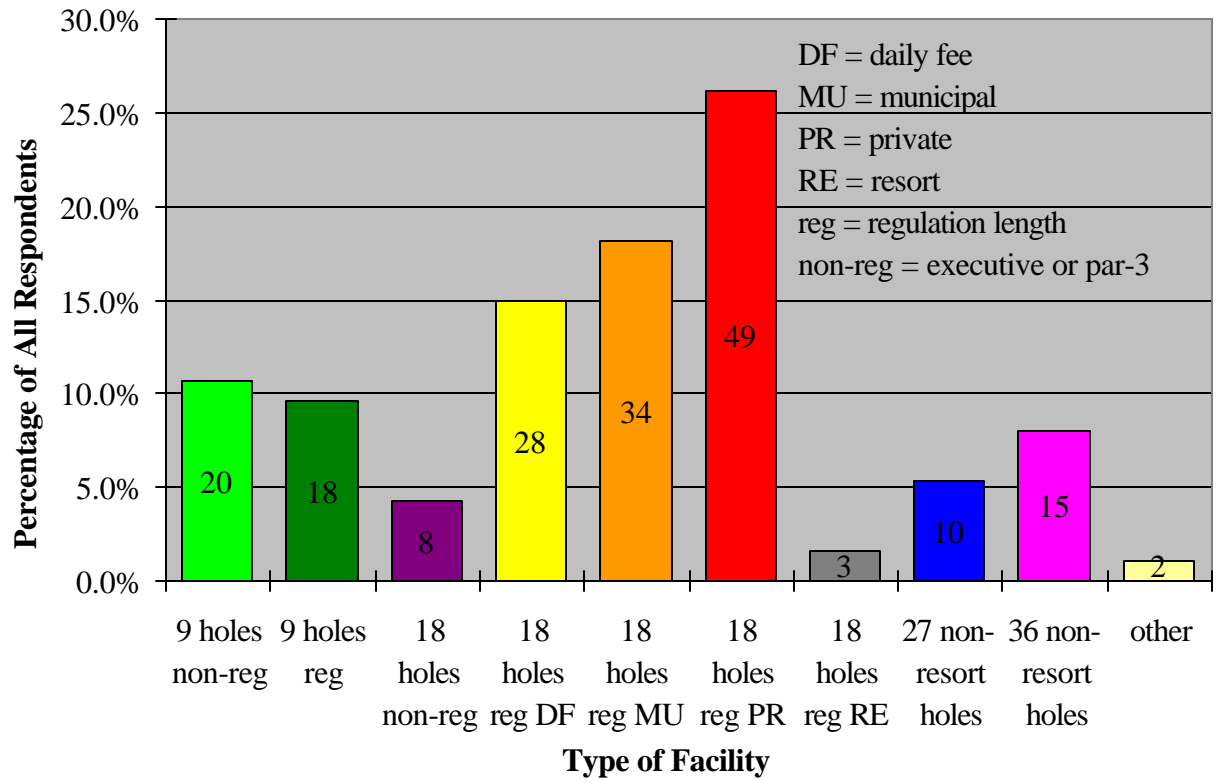


Table 1: Distribution of All Golf-Course Facilities in California in 2000

Number of Holes	Number of Facilities	Share of All Facilities	Access-Ownership	Par-3	Executive	Regulation
9 Holes	25	2.80%	DF	9	0	0
	14 ^x	1.57%	MU	9	0	0
	11	1.23%	PR	9	0	0
	4	0.45%	RE	9	0	0
	42	4.71%	DF	0	9	0
	21	2.36%	MU	0	9	0
	13	1.46%	PR	0	9	0
	3	0.34%	RE	0	9	0
	61	6.85%	DF	0	0	9
	25	2.81%	MU	0	0	9
	10	1.12%	PR	0	0	9
	4	0.45%	RE	0	0	9

^x One of these facilities has only a 3.5 acre chip-and-putt course, which was treated separately.

DF ≡ daily-fee courses, MU ≡ municipal courses, PR ≡ private courses, and RE ≡ resort courses.

Table 1 cont.: Distribution of All Golf-Course Facilities in California in 2000

Number of Holes	Number of Facilities	Share of All Facilities	Access-Ownership	Par-3	Executive	Regulation
18 Holes	7	0.79%	DF	18	0	0
	4	0.45%	MU	18	0	0
	2	0.22%	PR	18	0	0
	26	2.90%	DF	0	18	0
	6	0.67%	MU	0	18	0
	7	0.78%	PR	0	18	0
	172	19.30%	DF	0	0	18
	97	10.89%	MU	0	0	18
	200	22.45%	PR	0	0	18
	24	2.69%	RE	0	0	18

DF ≡ daily-fee courses, MU ≡ municipal courses, PR ≡ private courses, and RE ≡ resort courses.

Table 1 cont.: Distribution of All Golf-Course Facilities in California in 2000

Number of Holes	Number of Facilities	Share of All Facilities	Access-Ownership	Par-3	Executive	Regulation
27 Holes	1	0.11%	PR	27	0	0
	1	0.11%	DF	18	9	0
	1	0.11%	DF	9	18	0
	1	0.11%	DF	0	27	0
	5	0.56%	MU	9	0	18
	3	0.34%	PR	9	0	18
	1	0.11%	DF/RE	9	0	18
	3	0.34%	DF	0	9	18
	4	0.45%	MU	0	9	18
	1	0.11%	PR	0	9	18
	13	1.46%	DF	0	0	27
	2	0.22%	MU	0	0	27
	12	1.35%	PR	0	0	27
	5	0.56%	RE	0	0	27

DF ≡ daily-fee courses, MU ≡ municipal courses, PR ≡ private courses, and RE ≡ resort courses.

Table 1 cont.: Distribution of All Golf-Course Facilities in California in 2000

Number of Holes	Number of Facilities	Share of All Facilities	Access-Ownership	Par-3	Executive	Regulation
36 Holes	1	0.11%	RE	18	18	0
	1	0.11%	DF	18	0	18
	1	0.11%	MU	18	0	18
	1	0.11%	PR	9	0	27
	1	0.11%	DF	0	18	18
	1	0.11%	PR	0	18	18
	1	0.11%	RE	0	18	18
	1	0.11%	DF/RE	0	18	18
	1	0.11%	DF	0	9	27
	11	1.23%	DF	0	0	36
	10	1.12%	MU	0	0	36
	13	1.46%	PR	0	0	36
	8	0.89 %	RE	0	0	36
	1	0.11 %	DF/RE	0	0	18/18
	1	0.11 %	DF/PR	0	0	18/18

DF ≡ daily-fee courses, MU ≡ municipal courses, PR ≡ private courses, and RE ≡ resort courses.

Table 1 cont.: Distribution of All Golf-Course Facilities in California in 2000

Number of Holes	Number of Facilities	Share of All Facilities	Access-Ownership	Par-3	Executive	Regulation
45 Holes	1	0.11%	MU	9	0	36
	1	0.11%	PR	9	0	36
54 Holes	1	0.11%	RE	18	0	36
	2	0.22%	PR	0	0	54
	1	0.11%	RE	0	0	54
	1	0.11%	RE/PR	0	0	36/18

DF ≡ daily-fee courses, MU ≡ municipal courses, PR ≡ private courses, and RE ≡ resort courses.

Table 2: Revenues from All Sources

Facility Type	Sample size	Mean Revenues	Standard Deviation	Estimated Total Revenues	Estimated Standard Deviation of Total Revenues
9 holes, non-regulation	15	\$647,398	\$487,499	\$85,780,290	\$15,678,409
9 holes, regulation	16	\$775,910	\$437,077	\$77,203,028	\$9,955,025
18 holes, non-regulation	8	\$1,637,117	\$945,855	\$85,130,097	\$15,995,854
18 municipal holes, regulation	33	\$3,127,725	\$1,252,220	\$303,389,331	\$17,175,108
18 daily-fee holes, regulation	27	\$3,212,395	\$1,889,245	\$539,682,300	\$55,760,297
18 private holes, regulation	43	\$4,319,459	\$2,588,296	\$885,489,184	\$71,490,967
18 resort holes, regulation	3	\$29,716,350	\$19,648,932	\$1,797,839,155	\$640,007,092
27 non-resort holes	9	\$4,412,715	\$2,288,963	\$209,603,976	\$32,587,718
36 non-resort holes	15	\$9,018,330	\$3,984,666	\$360,733,180	\$31,733,413

Table 3: Golf Membership Dues, Green Fees, Car Fees, and Other Revenues^z

Facility Type	Sample size	Mean Golf Revenues	Standard Deviation	Estimated Total Golf Revenues	Estimated Standard Deviation of Total Golf Revenues
9 holes, non-regulation	14	\$481,764	\$380,009	\$63,833,756	\$12,705,748
9 holes, regulation	14	\$542,920	\$367,551	\$54,020,579	\$9,056,664
18 holes, non-regulation	6	\$1,021,526	\$502,586	\$53,119,361	\$10,034,954
18 municipal holes, regulation	30	\$2,138,158	\$685,257	\$207,401,337	\$10,085,932
18 daily-fee holes, regulation	22	\$2,019,725	\$1,183,267	\$339,313,734	\$39,399,172
18 private holes, regulation	39	\$2,240,531	\$1,291,602	\$459,308,929	\$37,946,517
18 resort holes, regulation	3	\$2,205,507	\$1,095,574	\$133,433,174	\$35,685,135
27 non-resort holes	7	\$3,229,937	\$1,435,013	\$153,421,997	\$23,767,395
36 non-resort holes	15	\$5,299,197	\$2,521,278	\$211,967,881	\$20,079,161

^z – ‘Other revenues’ includes advanced booking fees, pull cart fees, trail fees, and caddie fees.

Table 4: 18-Hole Equivalent Rounds

Facility Type	Sample Size	Mean Rounds	Standard Deviation	Estimated Total Rounds	Standard Deviation of Total Rounds
9 holes, non-regulation	16	24,354	18,771	3,226,843	581,965
9 holes, regulation	13	21,770	13,047	2,166,107	335,581
18 holes, non-regulation	7	46,315	21,956	2,408,365	401,437
18 municipal holes, regulation	33	77,285	19,947	7,496,620	273,593
18 daily-fee holes, regulation	20	38,221	11,293	6,421,136	397,184
18 private holes, regulation	38	36,156	13,606	7,411,996	406,245
18 resort holes, regulation	2	21,870	13,745	1,323,105	561,882
27 non-resort holes	6	94,612	27,255	4,494,080	493,642
36 non-resort holes	10	107,432	43,514	4,297,294	470,186

Table 5: Golf Dues and Fees per 18-Hole Equivalent Round and Course Quality

Facility Type	Sample Size	Mean Golf Dues and Fees	Standard Deviation	Sample Size	Mean Quality of Course(s)	Standard Deviation
9 holes, non-regulation	14	\$18	\$8	16	6.0	2.2
9 holes, regulation	12	\$27	\$9	17	6.4	2.5
18 holes, non-regulation	6	\$31	\$34	6	6.4	2.6
18 municipal holes, regulation	30	\$27	\$6	23	6.6	1.5
18 daily-fee holes, regulation	18	\$50	\$27	26	7.7	1.4
18 private holes, regulation	31	\$69	\$40	45	8.1	1.1
18 resort holes, regulation	2	\$104	\$5	3	8.0	1.7
27 non-resort holes	5	\$29	\$13	8	7.0	2.0
36 non-resort holes	10	\$58	\$60	12	8.0	1.4

Table 6: Golf Course and Other Landscape Maintenance Expenses

Facility Type	Sample Size	Mean Golf Course Maintenance Expenses	Standard Deviation	Estimated Total Golf Course Maintenance Expenses	Estimated Standard Deviation of Total Expenses
9 holes non-regulation	13	\$177,388	\$152,453	\$23,503,859	\$5,312,683
9 holes regulation	13	\$263,075	\$160,652	\$26,175,963	\$4,132,079
18 holes non-regulation	4	\$320,468	\$226,865	\$16,664,336	\$5,667,093
18 municipal holes, regulation	22	\$795,913	\$358,852	\$77,203,579	\$6,525,604
18 daily-fee holes, regulation	20	\$820,479	\$370,184	\$137,840,388	\$13,019,619
18 private holes, regulation	41	\$988,698	\$468,092	\$202,683,055	\$13,326,968
18 resort holes, regulation	3	\$899,995	\$278,380	\$54,449,698	\$9,067,427
27 non-resort holes	7	\$1,395,429	\$667,932	\$66,282,884	\$11,062,615
36 non-resort holes	11	\$2,072,992	\$829,007	\$82,919,695	\$8,381,227

Table 7: Food and Beverage Revenues

Facility Type	Sample Size	Mean Food and Beverage Revenues	Standard Deviation	Estimated Total Food and Beverage Revenues	Estimated Standard Deviation of Total Food and Beverage Revenues
9 holes, non-regulation	11	\$106,464	\$124,924	\$14,106,456	\$4,773,223
9 holes, regulation	12	\$121,232	\$106,131	\$12,062,619	\$2,857,688
18 holes, non-regulation	7	\$274,934	\$240,870	\$14,296,568	\$4,403,950
18 municipal holes, regulation	29	\$503,604	\$305,686	\$48,849,549	\$4,610,164
18 daily-fee holes, regulation	25	\$647,984	\$508,923	\$108,861,292	\$15,725,137
18 private holes, regulation	39	\$956,183	\$715,950	\$196,017,520	\$21,034,207
18 resort holes, regulation	3	\$7,732,302	\$4,528,329	\$467,804,271	\$147,497,199
27 non-resort holes	7	\$894,537	\$625,334	\$42,490,487	\$10,357,094
36 non-resort holes	13	\$1,460,469	\$882,478	\$58,418,757	\$7,884,910

Table 8: Merchandise Sales of Golf Shops

Facility Type	Sample Size	Mean Merchandise Sales of Golf Shops	Standard Deviation	Estimated Total Merchandise Sales of Golf Shops	Estimated Standard Deviation of Total Merchandise Sales of Golf Shops
9 holes, non-regulation	14	\$25,664	\$31,291	\$3,400,461	\$1,046,224
9 holes, regulation	16	\$46,110	\$40,781	\$4,587,971	\$928,837
18 holes, non-regulation	7	\$81,870	\$58,058	\$4,257,262	\$1,061,508
18 municipal holes, regulation	30	\$261,923	\$189,590	\$25,406,554	\$2,790,470
18 daily-fee holes, regulation	28	\$287,777	\$232,349	\$48,346,475	\$6,709,128
18 private holes, regulation	39	\$358,900	\$343,677	\$73,574,421	\$10,097,029
18 resort holes, regulation	3	\$444,676	\$249,995	\$26,902,918	\$8,142,859
27 non-resort holes	9	\$361,411	\$239,670	17,167,012	\$3,412,162
36 non-resort holes	14	\$1,159,491	\$1,794,391	\$46,379,620	\$15,124,330

Table 9: Areas of Clubhouses and Golf Shops

Facility Type	Area of Clubhouses ^y			Area of Golf Shops		
	Sample Size	Mean	Standard Deviation	Sample Size	Mean	Standard Deviation
9 holes, non-regulation	17	1,879	1,438	12	1,422	2,717
9 holes, regulation	15	3,281	2,459	17	859	432
18 holes, non-regulation	7	6,186	6,768	7	1,050	726
18 municipal holes, regulation	22	10,262	18,389	23	1,520	965
18 daily-fee holes, regulation	26	11,193	13,550	27	1,280	577
18 private holes, regulation	46	27,950	21,059	47	2,372	3,664
18 resort holes, regulation	1	26,000		3	2,167	1,850
27 non-resort holes	8	10,563	7,531	9	1,533	1,074
36 non-resort holes	14	28,910	22,380	14	4,726	7,700

^y - Excludes area of golf shop.

**Table 10: Type-of-Merchandise Shares by Type of Facility and
Shares of Final Purchase Price by Type of Merchandise**

	Type of Merchandise				
	Sector 452			Sector 455	
Facility Type	Men and Boys's Clothing	Women and Girls's Clothing	Shoes	Clubs, Bags, Balls, and Other Supplies	Books, Videos, and Other Items
18-hole, municipal, regulation course	0.28	0.12	0.07	0.51	0.02
18-hole, private, regulation course	0.34	0.16	0.08	0.39	0.03
18-hole, resort, regulation course	0.39	0.23	0.06	0.28	0.04
All others	0.32	0.16	0.07	0.42	0.03
Shares of Final Purchase Price					
Retailer's Share	0.477	0.533	0.543	0.493	0.402
Shipper's Share	0.005	0.004	0.004	0.010	0.010
Producer's Share	0.519	0.463	0.454	0.497	0.588

Meehan (2002) provided the information on the type-of-merchandise shares. We calculated shares of final purchase price with data from Table D in Lawson (1997, 50-53).

Table 11: Sectoral Allocation of Expenditures and Revenues in 2000

IMPLAN Sector	Expenditures	Revenues
Sector 27: Landscape and Horticultural Services	\$817,648,372	\$817,648,372
Sector 124: Apparel Making	\$59,821,291	\$598,213
Sectors 176 and 177, and 483: Book Publishing and Printing, and Motion Pictures	\$4,138,419	\$3,103,814
Sector 224: Shoe Making	\$8,162,765	\$81,628
Sector 309: Farm Machinery and Equipment	\$4,562,948	\$228,147
Sector 421: Sporting and Athletic Goods Manufacturing	\$52,614,222	\$26,307,111
Sector 435: Motor Freight Transport and Warehousing	\$1,946,701	\$1,946,701
Sector 447: Wholesale Trade	\$1,948,426	\$1,948,426
Sector 452: Apparel and Accessory Stores	\$68,933,238	\$68,933,238
Sector 454: Eating and Drinking	\$962,907,520	\$962,907,520
Sector 455: Miscellaneous Retail	\$54,972,618	\$54,972,618
Sector 463: Hotels and Lodging Places	\$797,351,457	\$797,351,457
Sector 488: Recreation and Amusement	\$1,157,727,997	\$1,157,727,997
Sector 489: Membership Sports and Recreation Clubs	\$357,494,508	\$357,494,508
All Sectors	\$4,350,230,481	\$4,251,249,750

Table 12: Gross Sales Impacts in 2000 (\$1000s)

IMPLAN Sector Names (Numbers)	Direct	Indirect	Induced	Total
Agriculture (1-26 except 23)	\$0	\$33,080	\$19,701	\$52,781
Greenhouses and Nurseries (23)	\$0	\$82,811	\$1,797	\$84,609
Horticultural Service (27)	\$817,648	\$6,268	\$2,001	\$825,917
Mining (28-47 and 57)	\$0	\$5,039	\$5,512	\$10,551
Construction (48-56)	\$0	\$64,173	\$27,638	\$91,811
Food and Beverage Manufacturing (58-103)	\$0	\$90,647	\$61,557	\$152,204
Apparel Manufacturing (124)	\$598	\$398	\$9,942	\$10,938
Book and Video Production (176, 177, and 483)	\$3,104	\$6,629	\$14,642	\$24,375
Shoe Manufacturing (224)	\$82	\$2	\$167	\$251
Other Manufacturing (104-432 except 124, 176, 177, 224, 309, 421)	\$0	\$183,592	\$260,700	\$444,292
Farm Machinery and Equipment (309)	\$228	\$138	\$69	\$435
Sporting and Athletic Goods (421)	\$26,307	\$439	\$444	\$27,190
Transportation, Communications, Power, and Utilities (433, 434, 436-446)	\$0	\$147,505	\$127,751	\$275,256
Motor Freight Transport and Warehousing (435)	\$1,947	\$27,464	\$21,502	\$50,913
Wholesale Trade (447)	\$1,948	\$128,798	\$114,696	\$245,443
Other Retail Trade (448-451, 453)	\$0	\$3,296	\$141,849	\$145,144
Apparel and Accessory Stores (452)	\$68,933	\$226	\$16,259	\$85,418
Eating and Drinking Stores (454)	\$962,908	\$20,026	\$85,406	\$1,068,340
Miscellaneous Retail (455)	\$54,973	\$1,585	\$52,713	\$109,270
Finance, Insurance, and Real Estate Services (456-462)	\$0	\$229,643	\$421,183	\$650,826
Hotels and Lodging Places (463)	\$797,352	\$14,303	\$20,596	\$832,251
Other Services (464-509, 484-487, and 490-509)	\$0	\$502,625	\$524,282	\$1,026,907
Amusement and Recreation (488)	\$1,157,728	\$1	\$16,510	\$1,174,239
Membership Sports and Recreation Clubs (489)	\$357,494	\$299	\$4,804	\$362,598
Public Administration (510-528)	\$0	\$42,659	\$77,324	\$119,984
All Sectors	\$4,251,249	\$1,591,647	\$2,029,044	\$7,871,940

Table 13: Value-Added Impacts in 2000 (\$1000s)

IMPLAN Sector Names (Numbers)	Direct	Indirect	Induced	Total
Agriculture (1-26 except 23)	\$0	\$17,445	\$10,390	\$27,835
Greenhouses and Nurseries (23)	\$0	\$66,942	\$1,453	\$68,395
Horticultural Service (27)	\$537,664	\$4,122	\$1,316	\$543,101
Mining (28-47 and 57)	\$0	\$3,382	\$3,700	\$7,082
Construction (48-56)	\$0	\$26,169	\$11,271	\$37,439
Food and Beverage Manuf. (58-103)	\$0	\$25,856	\$17,558	\$43,414
Apparel Manufacturing (124)	\$176	\$117	\$2,919	\$3,212
Book and Video Production (176, 177, and 483)	\$1,686	\$3,601	\$7,954	\$13,242
Shoe Manufacturing (224)	\$38	\$1	\$78	\$118
Other Manufacturing (104-432 except 124, 176, 177, 224, 309, and 421)	\$0	\$72,212	\$102,541	\$174,753
Farm Machinery and Equipment (309)	\$65	\$39	\$20	\$124
Sporting and Athletic Goods (421)	\$11,204	\$187	\$189	\$11,579
Transport, Communications, Power, and Utilities (433-446 except 435)	\$0	\$89,817	\$77,788	\$167,605
Motor Freight Transport and Warehousing (435)	\$840	\$11,851	\$9,278	\$21,969
Wholesale Trade (447)	\$1,334	\$88,160	\$78,508	\$168,001
Other Retail Trade (448-451, 453)	\$0	\$2,890	\$124,389	\$127,279
Apparel and Accessory Stores (452)	\$51,177	\$168	\$12,071	\$63,415
Eating and Drinking Stores (454)	\$550,590	\$11,451	\$48,835	\$610,875
Miscellaneous Retail (455)	\$46,377	\$1,337	\$44,471	\$92,184
Finance, Insurance, and Real Estate Services (456-462)	\$0	\$168,787	\$309,568	\$478,355
Hotels and Lodging Places (463)	\$530,212	\$9,511	\$13,695	\$553,418
Other Services (464-509, 484-487, and 490-509)	\$0	\$329,236	\$343,422	\$672,658
Amusement and Recreation (488)	\$774,097	\$1	\$11,039	\$785,137
Membership Sports and Recreation Clubs (489)	\$204,056	\$171	\$2,742	\$206,969
Public Administration (510-528)	\$0	\$38,429	\$69,657	\$108,086
All Sectors	\$2,709,514	\$971,881	\$1,304,851	\$4,986,246

Table 14: Employment Impacts in 2000

IMPLAN Sector Names (Numbers)	Direct	Indirect	Induced	Total
Agriculture (1-26 except 23)	0	609	363	972
Greenhouses and Nurseries (23)	0	1,550	34	1,583
Landscape and Horticultural Service (27)*	13,799	149	48	13,996
Mining (28-47 and 57)	0	20	21	41
Construction (48-56)	0	549	236	786
Food and Beverage Manufacturing (58-103)	0	317	215	532
Apparel Manufacturing (124)	7	4	108	119
Book and Video Production (176, 177, and 483)	22	48	106	176
Shoe Manufacturing (224)	2	0	3	5
Other Manufacturing (104-432 except 124, 176, 177, 224, 309, and 421)	0	914	1,299	2,213
Farm Machinery and Equipment Manufacturing (309)	1	1	0	2
Sporting and Athletic Good Makers (421)	211	4	4	218
Transportation, Communications, Power, and Utilities (433-446 except 435)	0	663	574	1,238
Motor Freight Transport and Warehousing (435)	18	254	199	472
Wholesale Trade (447)	15	1,006	896	1,917
Other Retail Trade (448-451 and 453)	0	62	2,657	2,719
Apparel and Accessory Stores (452)*	5,297	4	309	5,610
Eating and Drinking Stores (454)*	21,610	496	2,114	24,220
Miscellaneous Retail (455)*	5,235	37	1,243	6,515
Finance, Insurance, and Real Estate Services (456-462)	0	907	1,664	2,572
Hotels and Lodging Places (463)*	3,432	229	329	3,990
Other Services (464-509, 484-487, and 490-509)	0	7,185	7,495	14,680
Amusement and Recreation (488)*	9,552	0	506	10,058
Membership Sports and Recreation Clubs (489)*	2,972	9	148	3,130
Public Administration (510-528)	0	717	1,300	2,017
All Sectors	62,173	15,735	21,873	99,782

*These direct impacts were estimated with survey data, not the IMPLAN model.

Table 15: Jobs for Food and Beverage Service

Facility Type	Sample Size	Mean Jobs for Food and Beverage Service (FTEs)	Standard Deviation	Estimated Total Jobs for Food and Beverage Service (FTEs)	Estimated Standard Deviation of Total Jobs for Food and Beverage Service
9 holes, non-regulation	16	3	3	340	85
9 holes, regulation	13	2	2	237	62
18 holes, non-regulation	7	7	8	371	148
18 municipal holes, regulation	20	8	5	778	88
18 daily-fee holes, regulation	23	13	10	2,118	320
18 private holes, regulation	41	26	18	5,320	501
18 resort holes, regulation	2	174	93	10,550	3,794
27 non-resort holes	7	15	12	719	198
36 non-resort holes	14	29	23	1,172	192

Table 16: Jobs for Golf Course and Other Landscape Maintenance

Facility Type	Sample Size	Mean Jobs (FTEs) for Golf Course Maintenance	Standard Deviation	Estimated Total Jobs (FTEs) for Golf Course Maintenance	Est. Standard Deviation of Total Jobs for Golf Course Maintenance
9 holes, non-regulation	16	4	3	551	97
9 holes, regulation	13	5	2	509	62
18 holes, non-regulation	7	12	11	609	193
18 municipal holes, regulation	20	13	6	1,248	110
18 daily-fee holes, regulation	25	16	7	2,715	229
18 private holes, regulation	41	20	9	4,173	255
18 resort holes, regulation	3	24	4	1,452	130
27 non-resort holes	8	19	8	897	124
36 non-resort holes	14	41	16	1,621	131

Table 17: Jobs for Golf Shop Operations

Facility Type	Sample Size	Mean Jobs for Golf Shop Operations (Full-Time Equivalents)	Standard Deviation	Estimated Total Jobs for Golf Shop Operations (FTEs)	Estimated Standard Deviation of Total Jobs for Golf Shop Operations
9 holes, non-regulation	16	4	2	474	77
9 holes, regulation	14	4	2	404	61
18 holes, non-regulation	7	7	5	364	97
18 municipal holes, regulation	20	11	5	1,075	87
18 daily-fee holes, regulation	26	13	7	2,113	209
18 private holes, regulation	43	10	7	2,065	181
18 resort holes, regulation	3	34	15	2,077	475
27 non-resort holes	8	15	9	704	134
36 non-resort holes	14	31	14	1,246	121

Table 18: All Jobs at Golf Course Facilities

Facility Type	Sample Size	Mean Jobs (Full-Time Equivalent)	Standard Deviation	Estimated Total Jobs (FTEs)	Estimated Standard Deviation of Total Jobs
9 holes, non-regulation	16	12	8	1,548	233
9 holes, regulation	14	12	6	1,230	149
18 holes, non-regulation	7	27	18	1,404	328
18 municipal holes, regulation	20	33	15	3,229	288
18 daily-fee holes, regulation	26	46	22	7,773	656
18 private holes, regulation	42	67	34	13,689	942
18 resort holes, regulation	3	367	257	22,224	8,380
27 holes	8	50	26	2,374	399
36 holes	14	125	57	5,005	477

Table 19: Employee Compensation Impacts in 2000

IMPLAN Sector Names (Numbers)	Direct	Indirect	Induced	Total
Agriculture (1-26 except 23)	\$0	\$6,542	\$3,896	\$10,439
Greenhouses and Nurseries (23)	\$0	\$25,065	\$544	\$25,609
Landscape and Horticultural Service (27)	\$288,370	\$2,211	\$706	\$291,286
Mining (28-47 and 57)	\$0	\$1,083	\$1,184	\$2,267
Construction (48-56)	\$0	\$16,832	\$7,250	\$24,082
Food and Beverage Manufacturing (58-103)	\$0	\$12,990	\$8,821	\$21,811
Apparel Manufacturing (124)	\$140	\$93	\$2,330	\$2,564
Book and Video Production (176, 177, and 483)	\$1,363	\$2,910	\$6,428	\$10,701
Shoe Manufacturing (224)	\$28	\$1	\$57	\$86
Other Manufacturing (104-432 except 124, 176, 177, 224, 309, and 421)	\$0	\$48,230	\$68,486	\$116,716
Farm Machinery and Equipment (309)	\$42	\$25	\$13	\$80
Sporting and Athletic Goods (421)	\$5,753	\$96	\$97	\$5,946
Transport., Communications, Power, and Utilities (433-446 except 435)	\$0	\$33,974	\$29,424	\$63,399
Motor Freight Transport and Warehousing (435)	\$487	\$6,867	\$5,376	\$12,729
Wholesale Trade (447)	\$716	\$47,350	\$42,166	\$90,233
Other Retail Trade (448-451 and 453)	\$0	\$1,607	\$69,149	\$70,755
Apparel and Accessory Stores (452)	\$24,945	\$82	\$5,884	\$30,911
Eating and Drinking Stores (454)	\$334,314	\$6,953	\$29,652	\$370,920
Miscellaneous Retail (455)	\$20,250	\$584	\$19,417	\$40,251
Finance, Insurance, and Real Estate Services (456-462)	\$0	\$33,496	\$61,434	\$94,930
Hotels and Lodging Places (463)	\$293,768	\$5,270	\$7,588	\$306,625
Other Services (464-509, 484-487, and 490-509)	\$0	\$224,620	\$234,299	\$458,919
Amusement and Recreation (488)	\$392,610	\$1	\$5,599	\$398,209
Membership Sports and Recreation Clubs (489)	\$144,498	\$121	\$1,942	\$146,560
Public Administration (510-528)	\$0	\$32,010	\$58,021	\$90,030
All Sectors	\$1,507,283	\$509,012	\$669,763	\$2,686,058

Table 20: Employee Compensation

Facility Type	Sample Size	Mean Employment Compensation	Standard Deviation	Estimated Total Employee Compensation	Est. Standard Deviation of Total Employee Compensation
9 holes, non-regulation	8	\$229,750	\$169,487	\$30,441,875	\$7,689,635
9 holes, regulation	12	\$189,823	\$86,484	\$18,887,437	\$2,328,670
18 holes, non-regulation	7	\$543,355	\$394,677	\$28,254,453	\$7,216,062
18 municipal holes, regulation	18	\$653,599	\$386,221	\$63,399,148	\$7,968,917
18 daily-fee holes, regulation	23	\$1,076,896	\$651,652	\$180,918,528	\$21,145,152
18 private holes, regulation	37	\$1,666,742	\$860,132	\$341,682,196	\$26,108,918
18 resort holes, regulation	3	\$8,717,378	\$5,859,796	\$527,401,389	\$190,865,905
27 non-resort holes	6	\$1,435,607	\$908,568	\$68,191,331	\$16,455,786
36 non-resort holes	11	\$2,781,873	\$1,880,203	\$111,274,913	\$19,008,778

Table 21: Tax Impacts

Type of Tax	State and Local	Federal	All Government
Corporate Profits Tax	\$24,799,268	\$105,232,219	\$130,031,487
Dividends	\$280,327	\$0	\$280,327
Indirect Business Tax: Custom Duties	\$0	\$13,149,920	\$13,149,920
Indirect Business Tax: Excise Taxes	\$0	\$41,261,232	\$41,261,232
Indirect Business Tax: Motor Vehicle Licenses	\$2,867,978	\$0	\$2,867,978
Indirect Business Tax: Property Taxes	\$128,588,571	\$0	\$128,588,571
Indirect Business Tax: Royalties, Fines, Special Assessments, and Fees	\$20,692,074	\$10,332,080	\$31,024,154
Indirect Business Tax: Sales Taxes	\$202,483,513	\$0	\$202,483,513
Indirect Bus Tax: Severance Taxes	\$172,293	\$0	\$172,293
Indirect Bus Tax: Other Taxes	\$21,118,085	\$0	\$21,118,085
Indirect Business Tax: Subtotal	\$375,922,514	\$64,743,233	\$440,665,746
Personal Tax: Income Tax	\$82,250,902	\$333,979,280	\$416,230,182
Personal Tax: Motor Vehicle Licenses	\$3,990,054	\$0	\$3,990,054
Personal Tax: Fines, Donations, and Passport Fees	\$21,101,366	\$3,293,783	\$24,395,149
Personal Tax: Hunting, Fishing, and Other Personal Licenses	\$667,743	\$0	\$667,743
Personal Tax: Property Taxes	\$1,535,833	\$0	\$1,535,833
Personal Tax: Subtotal	\$109,545,897	\$337,273,064	\$446,818,961
Social Insurance Tax: Employee Contribution	\$1,468,119	\$181,615,259	\$183,083,378
Social Insurance Tax: Employer Contribution	\$6,688,097	\$162,427,551	\$169,115,648
Social Insurance Tax: Subtotal	\$8,156,216	\$344,042,810	\$352,199,026
Total	\$518,704,221	\$851,291,325	\$1,369,995,546

Table 22: Financial Support of Charities

Facility Type	Sample Size	Mean Financial Support of Charities	Standard Deviation	Estimated Total Financial Support of Charities	Est. Standard Deviation of Total Financial Support of Charities
9 holes, non-regulation	12	\$3,033	\$7,144	\$401,917	\$260,226
9 holes, regulation	10	\$9,680	\$16,761	\$963,160	\$500,048
18 holes, non-regulation	5	\$11,600	\$12,361	\$603,200	\$273,292
18 municipal holes, regulation	16	\$22,875	\$74,159	\$2,218,875	\$1,643,362
18 daily-fee holes, regulation	25	\$111,127	\$269,021	\$18,669,334	\$8,312,436
18 private holes, regulation	41	\$51,414	\$87,410	\$10,539,910	\$2,488,638
18 resort holes, regulation	2	\$357,500	\$484,368	\$21,628,750	\$19,799,840
27 non-resort holes	6	\$113,333	\$190,333	\$5,383,333	\$3,447,269
36 non-resort holes	8	\$119,375	\$172,201	\$4,775,000	\$2,155,998