10. Revenues and subsidies in collegiate sports: an analysis of NCAA Division I women's basketball

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10.1 INTRODUCTION

In the nearly 40 years since it was passed and signed into law by President Richard Nixon, Title IX of the Educational Amendments of 1972 has required colleges and universities to offer female student-athletes opportunities comparable to male student-athletes. Partly as a result, the number of women participating in intercollegiate sports has increased from around 30,000 in 1971 to over 165,000 in 2005 (National Coalition for Women and Girls in Education, 2008). Controversy has surrounded Title IX since its inception, primarily because athletic administrators view Title IX as an additional economic constraint within which they must operate. Administrators at schools with large 'revenue-producing' football or men's basketball teams, which have traditionally subsidized non-revenue sports, may be forced to transfer revenue from non-revenue men's sports to women's sports. The size of the transfer depends on the size of the surplus revenues generated across all athletic teams as well as the women's sports teams in particular.

Revenue-producing inter-collegiate athletic programs often rely on football or men's basketball to subsidize non-revenue sports and general athletic expenses (Leeds et al., 2004). The National Collegiate Athletic Association (NCAA), the umbrella organization that establishes rules for colleges with the most prestigious sports programs, restricts the mobility of athletes between schools and controls recruiting of and compensation for these student-athletes. Currently, compensation to NCAA student-athletes is limited to the value of an athletic scholarship (tuition, fees, room, board, and books) plus a small amount of income that a player can earn, which is less than the revenues produced by the best student-athletes. As a result, revenue-producing players generate economic rents that can subsidize non-revenue athletic programs and other recipients. The NCAA recently rejected paying athletes directly, in the form of a \$2,000 stipend (Associated Press, 2011; Eichelberger, 2011). While \$40 a week would clearly help student-athletes with incidental expenditures such as gasoline

or entertainment, it would not compensate the best athletes for the revenues they generate. On the other hand, a \$2,000 stipend to athletes in non-revenue-producing sports would amount to an additional transfer from revenue producers.

There are few empirical estimates of the revenues generated by college athletes because of the lack of reliable data on athletic revenues and the lack of direct measures of player skills and productivity. Brown (1993, 1994) and Brown and Jewell (2004) estimate the marginal revenue product (MRP) of NCAA football and men's basketball players by regressing a college team's revenues on the number of 'premium players' on the team, where a premium player is defined as a college player who is eventually drafted into the National Football League (NFL) or the National Basketball Association (NBA), holding constant other factors that influence revenues. Since only the best college players are drafted, professional draft data proxy for the skill level of an individual college football or basketball player. Brown (1993) shows that the MRP of a premium college football player (that is, a future NFL draftee) exceeds \$500,000 in 1988–89 revenues for his college team, while Brown and Jewell (2004) find a value closer to \$400,000 when considering a larger sample of schools.

More recent estimates indicate that a premium college football player's MRP exceeded \$1,000,000 during the 2004–05 season (Brown, 2011). A premium men's college basketball player (that is, a future NBA draftee) generated approximately \$1,000,000 in 1988–89 revenues for his college team (Brown, 1994), as confirmed in Brown and Jewell (2004). From an economic perspective, the excess revenues above the maximum NCAA-mandated payment to student-athletes constitute monopsony rents that are transferred to other parties. These include administrative and coaching salaries, athletic facilities, and unprofitable sports teams (Kahn, 2007).

Brown and Jewell (2006) use the methodology from earlier studies to estimate the MRP of a premium college women's basketball player using 2000–01 data, where a premium player is defined as one who is eventually drafted into the Women's National Basketball Association (WNBA). Team revenue data were from Equity and Athletic Disclosure Act (EADA), where total revenues were aggregated across ticket sales, guarantees/options, concessions, radio and television, government support, student fees, and institutional support, among other sources. The authors' results indicate that a premium women's college basketball player generates approximately \$300,000 per year in revenues for her school.

However, their quantile regression estimates show that these effects vary considerably across schools, with premium players at the best programs generating well in excess of the average, as might be expected. It appears that, by the dawn of the twenty-first century, at least some NCAA

women's basketball teams required lower subsidies from the athletic department or the university budget and that a few teams had become net-revenue producers and, thus, net subsidizers of other sports. Specifically, premium women players at elite basketball programs generate rents that, like rents from revenue-producing football and men's basketball programs, may be transferred to non-revenue-producing programs.

The aggregate nature of the 2000–01 EADA data used by Brown and Jewell (2006) confound the marginal revenue estimates by including revenue sources that are likely to be independent of a team's current players, such as student fees and institutional and government support. In the present chapter, we update and improve the 2000–01 estimates using data on team revenues from 2004–05 comprising 15 separate revenue categories. To give a more complete picture of the value of current star players, we estimate players' MRP using disaggregated team revenue data.

In Section 10.2, we present a model of the revenues generated by the most-talented female basketball players, using Brown's (1993) methodology and detailed data from the 2004–05 basketball season. In Section 10.3, we estimate the model using quantile regressions, and we discuss the implications of these results. We find, for example, that the value of a premium player varies widely, depending on the percentile of the estimation. She can bring as little as \$22,000 or as much as \$200,000 in revenue to her program. In Section 10.4, we briefly review the literature on the funding of women's programs. We differentiate between women's basketball programs that directly generate revenues and those that require transfers (implicit or explicit) from other revenue sources, such as student fees and institutional support. We sketch the flow of revenues between women's basketball programs and other entities, such as institutional support, student fees, and other athletic programs. We find that, although there are wide differences in revenues, costs, and subsidies across NCAA Division I women's basketball programs, these programs cannot completely fund themselves and must receive some sort of subsidy. Section 10.5 concludes.

10.2 DATA ANALYSIS AND MODEL

Past research on revenues in college sports has generally looked at the earning potential of student-athletes as indicated by *total* athletic revenues. However, aggregate revenue data come from many different sources. Some of the revenues allocated to women's basketball, such as student fees, government and institutional aid, or endowment and investment income, are likely to be independent of the skill levels of current team members. As a result, aggregate revenue data do not allow us to track the

flow of athletic monies across the university, athletic department, and third-party sources, or across programs within the athletic department.

This chapter supplements previous research with more detailed financial information collected by the *Indianapolis Star* from the NCAA through public information requests. Biannually, the NCAA requires member schools to complete a survey detailing all sources of revenues and all expenses on football, men's basketball, and women's basketball. These data identify 15 revenue categories for 160 Division I women's basketball teams during the 2004–05 basketball season, approximately half of the 328 schools competing in NCAA Division I that year. Since these data were collected via public information requests, they include only public universities. There were 31 conferences plus independents (that is, schools not affiliated with a conference) in Division I during the 2004–05 basketball season, and our dataset covers 27 conferences and independents. Because the Ivy League, the Metro-Atlantic Athletic Conference, the Patriot League, and the West Coast Conference consist largely of private colleges, which do not have to disclose their data, we exclude these conferences from the analysis.

Table 10.1 summarizes our sample of NCAA Division I women's basketball programs by revenue category. Details of the types of revenues included in each category appear in Appendix 10A. Many categories of women's basketball revenues may be unrelated to the quality of the team's current players. For example, we expect premium *current* players to directly increase the demand for ticket sales, game day concessions and parking fees, contributions (that is, direct contributions and those required in excess of a ticket value), advertising and sponsorships, and perhaps guarantees from away-game attendance. However, these 'direct revenues' average only 47 percent of all revenues in women's basketball. The remaining 53 percent of revenues come from sources independent of the current team's quality, such as student fees, government and institutional aid, and endowment/investment income. Among these revenue sources, student fees and direct institutional support are the largest shares, together averaging about 40 percent of revenues for women's basketball programs.

Table 10.1 shows that an average NCAA women's basketball team produced \$494,840 in revenues in the 2004–05 season, with a wide dispersion across teams. The standard deviation is over \$300,000, with the highest revenues exceeding \$5.5 million and the lowest just over \$5,500. On average, ticket sales comprised 25 percent of revenues, followed closely by 24 percent from institutional support, 15 percent from student fees, and 13 percent from contributions. Each of the remaining categories totaled less than 5 percent of total revenues. The distribution of total revenues across teams is highly skewed to the right, so the mean is greater than the median.

Table 10.1 Women's basketball revenues and expenses (n = 160) (\$)

Revenue category	Mean	Median	Std dev.	Max.	Min.
Ticket sales	124,503	17,313	537,619	4,227,145	510
Student fees	73,703	0	544,563	1,145,908	0
Guarantees	6,187	2,000	551,779	53,959	0
Contributions	64,646	11,112	559,304	1,334,497	0
Third party support	5,709	0	567,175	153,488	0
Direct government support	7,460	0	575,341	249,640	0
Direct institutional support	120,867	334	583,871	1,522,310	0
Indirect support	10,815	0	592,791	366,543	0
NCAA/conf. distributions	11,492	0	602,134	224,850	0
Broadcast rights	10,987	0	611,933	836,870	0
Game day sales	11,379	149	622,226	252,775	0
Royalties and advertising	13,106	0	633,058	405,003	0
Sports camps	23,684	0	644,475	644,475	0
Investment income	6,913	0	656,560	272,072	0
Other revenues	3,390	0	669,324	120,861	0
Total revenues	494,840	316,213	682,863	5,555,758	5,510
Total expenses	907,264	1,184,835	748,334	5,582,514	240,250
Revenues minus expenses	-620,752	-689,994	595,873	1,475,661	-2,282,708

Source: Indianapolis Star.

Table 10.2 Deciles of total revenues

Percentile (%)	10	20	30	40	50	60	70	80	90
Revenues (\$)	27,069	67,882	109,467	182,391	316,213	479,503	574,855	799,467	1,086,809

Source: Indianapolis Star.

Before developing a model based on these disaggregated data, we examine the distribution of revenue across colleges. Table 10.2 lists deciles for total revenues of women's basketball teams in the 2004–05 season. The data suggest that total revenue from women's basketball is skewed to the right. This conclusion is supported by our calculation that 62 percent of

Table 10.3 Revenue category comparisons

	Teams $\leq$ 35th%	Teams $\geq$ 50th%
Ticket sales	23	26
Student fees	0	16
Guarantees	12	1
Contributions	16	13
Third party support	2	1
Direct government support	1	1
Direct institutional support	16	24
Indirect support	5	2
NCAA/conf. distributions	3	2
Broadcast rights	0	2
Game day sales	2	2
Royalties and advertising	4	2
Sports camps	11	5
Investment income	2	1
Other revenues	3	1

Source: Indianapolis Star.

teams report less than the \$494,840 mean team revenues in 2004–05. Fifty percent of the teams in the sample earned revenues under \$316,213, with 38 percent of teams producing revenues over \$500,000, four of which had over \$2 million in total revenues.

Table 10.3 disaggregates total revenue by source and shows how much each source contributed for teams at or below the 35th percentile and teams at or above the median. Teams in the upper half of the *Total Revenues* distribution receive a slightly higher proportion of revenues from ticket revenues and a much higher proportion from student fees and direct institutional support. On the other hand, teams in the bottom 35 percent generate 12 percent of their revenue from away-game guarantees, while teams in the upper half generate only 1 percent. Strong teams in search of an easy win often use such guaranteed payments as a way to attract weak competition. The bottom 35 percent also receive a slightly larger percentage of their revenue from contributions.

Next, we compare disaggregated revenues across revenue quintiles for NCAA Division I women's basketball teams. Table 10.4 lists the averages for all revenue categories in dollar amounts for each of the five quintiles of total revenue. The trends that we discern below from Table 10.4 motivate us to investigate the relationship between revenue source and revenue quintile more closely in Section 10.4.

Table 10.4 Average revenues by category within each quintile of total revenues(%)

	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Ticket sales	9,990	28,602	49,883	91,139	429,985
Student fees	0	4,223	31,011	130,990	208,313
Guarantees	9,813	4,603	6,538	6,078	3,941
Contributions	3,788	15,442	59,023	69,594	171,133
Third party support	335	5,693	2,041	2,854	17,089
Direct government support	0	1,078	6,966	21,066	14,130
Direct institutional support	2,511	22,714	78,849	186,239	308,066
Indirect support	0	5,491	7,416	20,669	19,877
NCAA/conf. distributions	804	3,446	13,773	12,027	26,577
Broadcast rights	0	135	6,209	5,875	41,419
Game day sales	694	3,945	7,242	11,969	32,042
Royalties/advertising	963	3,119	15,889	14,717	29,906
Sports camps	2,657	12,690	29,694	23,936	48,431
Investment income	360	1,812	5,360	2,438	23,850
Total revenues	32,515	115,583	321,046	606,810	1,379,985

Source: Indianapolis Star.

Several patterns regarding ticket sales and total revenues emerge from these disaggregated data. First, average total revenues increase at a decreasing rate moving from the first to the fourth quintiles but then jump at a higher rate from the fourth to the fifth quintile. Second, ticket revenues increase at a decreasing rate over quintiles one to three and then at an increasing rate from quintiles three to five. Third, the percentage of total revenue that comes from ticket sales falls from quintiles one through four, and then rises in the fifth quintile. Taken together, these observations suggest that teams rely less on ticket revenues as their overall revenues rise, but ticket revenue spikes for the most successful programs.

To gain a deeper understanding of the determinants of team revenue and its components, we develop an empirical model. We use the disaggregated revenue data to distinguish revenues that are closely tied to the quality of current players from revenues that are, arguably, independent of player quality. To generate estimates of MRP for women's basketball players, we employ three measures of revenues. The first dependent variable includes only *Ticket Revenues*, which is presumably most directly correlated with the performance and skill levels of current players. Estimates of the MRP of female college basketball players using *Ticket Revenues*

evaluate their impact on game-day demand. The second dependent variable (*Direct Revenues*) is the sum of ticket revenues, contributions, game-day concessions, away-game guarantees, conference distributions, royalties, advertisements, and sponsorships. This broader measure of revenues is closely tied to current players, so MRP estimates using *Direct Revenues* reflect the ability of female student-athletes to generate revenues from a range of sources beyond game attendance. The third dependent variable (*Total Revenues*) aggregates all 15 categories of revenues. MRP estimates using *Total Revenues* are comparable to existing estimates in the literature and include many revenue sources that may be independent of a team's current players.

Following the methodology detailed in Brown (1993, 1994), we estimate a women's college basketball player's marginal revenue product by regressing a team's 2004–05 revenues on the number of its players drafted from its 2004–05 roster into the WNBA, and on other control variables. We assume that a college basketball team's revenues are a function of the quality of the team, the quality of its opponents, and its market demand characteristics. The basic revenue relationship is given in equation (10.1), where i indexes team, j indexes opponent, Q_i indicates team quality as the sum of its players' skill levels, M represents market characteristics, and R is a function that maps team quality, opponent quality, and market characteristics onto revenues:

$$\text{Revenues}_i = R(Q_i, Q_j, M_i). \quad (10.1)$$

Using Brown's methodology, player skill is proxied by whether a player is drafted by a professional team. In the case of women's basketball, the WNBA, established in 1997, provides the necessary professional-draft data. A player is a 'premium player' if she is drafted into the WNBA at the end of her college career. Team quality (Q_i) is the sum of all premium players (that is, future WNBA draftees) on a school's squad during the 2004–05 season. Players who were on a college team's 2004–05 roster could have been drafted into the WNBA in 2005, 2006, 2007, or 2008. For example, a premium junior player contributes to her 2004–05 college team revenues but cannot be drafted until 2006. Following Brown and Jewell (2006), we disregard players who were freshmen in 2004–05. Freshman players are unlikely to have much of an impact on team skill, especially in women's basketball, where nearly all student-athletes play for their entire four-year eligibility period. Thus, the WNBA-draft measure, *Draft*, includes only those players who were sophomores, juniors, or seniors in 2004–05.

The number of premium players may not measure the overall quality

of a team, especially a team that has no premium players. In order to measure Q_i more completely, we include a measure of overall team quality based on the ratings performance index (RPI) of women's basketball teams. RPI is a weighted average of a team's winning percentage and that of its opponents; thus, it measures team quality conditional on schedule strength. RPI is often used to rank NCAA teams, especially in basketball, and the NCAA uses it to determine the participating teams and seeding for postseason basketball tournaments. We use the RPI-based ranking of all women's college basketball teams produced by *Collegiate Basketball News* (www.rpiratings.com) as of the end of the 2004–05 regular season. The variable *Rank* reports these RPI rankings. The top-ranked team for the regular season 2004–05 is given a value of 1, the second-ranked team is assigned 2, and so on until the last-ranked team has a value of 328. Given the reverse ordering of the ranking numbers, we expect the coefficient on *Rank* to be negative, since a higher rank (a lower number) should result in higher revenues.

The revenues that any school attracts are also a function of the quality of its opponents. Because college basketball teams play the majority of their games against conference opponents, we proxy for Q_j with a vector of dummy variables for conference (*Conference*), which accounts for unobservable conference effects. Following Brown and Jewell (2006), metro statistical area (MSA) population (*MSA*) measures market potential (M_i). The predicted sign on *MSA* is ambiguous, since a larger population implies a larger potential demand, but larger MSAs also tend to have more substitutes in terms of entertainment for sports fans and marketing opportunities for companies looking to sponsor athletic events. Table 10.5 presents summary statistics for the estimation sample.

Under the assumption that R is a linear function, our empirical model is given by equation (10.2):

$$\text{Revenues}_i = \alpha + \beta_1 \times \text{Draft} + \beta_2 \times \text{Rank} + \gamma \times \text{Conference}_i + \delta \times \text{MSA}_i + \varepsilon_i \quad (10.2)$$

The parameters α , β_1 , β_2 , and δ and the vector γ are coefficients to be estimated, and ε is the random error term. The coefficient β_1 is interpreted as the MRP of a premium women's basketball player. Recall that β_2 is expected to be negative, since *Rank* is ordered so that a lower number indicates a higher ranking.

The data in Tables 10.1 and 10.2 indicate a skewed distribution of team revenues, with the mean driven above the median by a few high-revenue teams. Standard OLS estimates around the conditional mean may be

Table 10.5 *Summary statistics (n = 160)*

Variable	Description	Mean	Std dev.
<i>Ticket Revenues</i>	Ticket sales for home games (2004–05)	\$ 124,503	\$ 399,112
<i>Direct Revenues</i>	Revenues from ticket sales, contributions, game-day concessions, away-game guarantees, conference distributions, and royalties, advertisements, and sponsorships (2004–05)	\$ 166,667	\$ 427,360
<i>Total Revenues</i>	Revenues from all sources (2004–05)	\$ 494,840	\$ 669,490
<i>Draft</i>	Number of WNBA draft picks (2005 to 2007)	0.481	0.978
<i>Rank</i>	End of regular season ranking (March 2005)	146.2	92.23
<i>MSA</i>	Population of metro statistical area (2000)	1,234,354	2,022,637

Sources: *Indianapolis Star*; wnba.com; rpiratings.com; census.gov.

sensitive to the existence of outliers in skewed data. Unlike OLS, which estimates the mean of the dependent variable, quantile regression (Koenker and Bassett, 1978) estimates the conditional median and other conditional percentiles of the dependent variable. As a result, it is particularly useful when the error term is not symmetrically distributed. Quantile regression estimators are robust to the presence of outliers, as in our data, while OLS estimators are generally not. In addition, quantile regression techniques allow us to analyze different parts of the conditional distribution of the dependent variable, while OLS estimates are conditional means. Thus, we also evaluate MRP at different points in the conditional distribution.

10.3 RESULTS AND DISCUSSION

Tables 10.6, 10.7, and 10.8 present MRP quantile regression estimates using *Ticket Revenues*, *Direct Revenues*, and *Total Revenues*, respectively, for the 20th, 35th, 50th (median), 65th, and 80th percentiles. Each reported estimation includes a complete set of conference dummies, which we suppress for the sake of brevity. Before discussing the results, we present two caveats. First, the estimates presented in the following tables may *overstate* MRP, given a potential endogeneity problem. Brown and Jewell (2006) point out that premium players are generally attracted to better programs,

Table 10.6 Estimates using Ticket Revenues ($n = 160$)

Variable	20%	35%	Median	65%	80%
<i>Draft</i>	12,427 (0.00)	29,857 (0.00)	102,316 (0.00)	96,593 (0.00)	169,217 (0.00)
<i>Rank</i>	-36.32 (0.00)	-43.87 (0.32)	-65.90 (0.15)	-124.71 (0.00)	-236.72 (0.00)
<i>MSA</i>	-0.0014 (0.00)	-0.0014 (0.45)	-0.0021 (0.20)	-0.0030 (0.00)	-0.0037 (0.14)
Constant	10,295 (0.00)	13,548 (0.35)	23,232 (0.09)	44,789 (0.00)	78,566 (0.00)
Adjusted R^2	0.10	0.13	0.19	0.26	0.34

Note: p -values in parentheses; coefficients at lower than 10% level in bold; estimations include complete set of conference dummies.

so the number of premium players may be correlated with unobservable factors, such as the quality of coaching or facilities, factors that also lead to greater revenues. Second, the estimates may *understate* the MRP of current players if the success of current players increases future women's basketball revenues or increases donations to the university's general fund.

Table 10.6 shows that a future WNBA draftee has a larger impact on ticket revenues at higher conditional percentiles of the dependent variable. For example, the median regression implies that an additional premium women's basketball player increases *Ticket Revenues* by \$102,316, over three times the size of the coefficient at the 35th percentile. The impact of star players stalls at the 65th percentile, as the coefficient on *Draft* is smaller than at the median, but the two coefficients are not statistically different from each other. The upward trend in MRP reappears when one moves from the 65th to the 80th percentile.

As expected, the coefficient on *Rank* is negative for all percentiles because a higher rank number implies a worse rank. The impact, though, is insignificant at the 35th and 50th percentiles. As with star players, the impact of team quality, measured by the coefficient on *Rank*, is greater at higher conditional percentiles. These results indicate that the impact of star players and team quality on ticket revenue is greater for teams whose ticket revenue is unusually high given the number of players drafted, the team's rank, and the rest of the explanatory variables.

The coefficient on *MSA* is consistently negative, but, like *Rank*, it is not significant for all percentiles. This resolves the theoretical ambiguity of the impact of *MSA*. The negative *MSA* coefficient implies that the negative effect of local competition for sports entertainment in areas with larger

Table 10.7 Estimates using Direct Revenues (tickets, contributions, game-day concessions, away-game guarantees, NCAA/conference distributions, royalties/advertisements/sponsorships) (n = 160)

Variable	20%	35%	Median	65%	80%
<i>Draft</i>	21,713 (0.00)	51,650 (0.00)	113,697 (0.00)	134,328 (0.00)	200,273 (0.00)
<i>Rank</i>	-62.19 (0.02)	-66.81 (0.01)	-157.00 (0.00)	-171.29 (0.01)	-323.30 (0.15)
<i>MSA</i>	-0.0025 (0.01)	-0.0032 (0.00)	-0.0057 (0.00)	-0.0070 (0.00)	-0.0091 (0.25)
Constant	19,662 (0.03)	34,401 (0.00)	65,127 (0.00)	82,179 (0.00)	131,259 (0.04)
Adjusted R^2	0.11	0.15	0.22	0.30	0.40

Note: p -values in parentheses; coefficients at lower than 10% level in bold; estimations include complete set of conference dummies.

populations outweighs any positive impact on revenues from having more potential women's basketball fans.

In Table 10.7, we present estimates using *Direct Revenues*, a broader measure of revenues that are directly related to current players. The signs of the coefficients on *Draft*, *Rank*, and *MSA* are largely consistent with those reported in Table 10.6. As above, *Draft* is consistently significant. *Rank* is significant at all but the highest percentile, as is *MSA*. A comparison of the MRP of a premium player on *Ticket Revenues* and on *Direct Revenues* suggests that most of the revenue-generating potential for a premium women's college basketball player comes from ticket sales, which suggests that additional revenue sources do not increase as much as gate revenue at each percentile.

At the lower percentiles, an additional future draftee adds relatively more to *Direct Revenues* compared to *Ticket Revenues* than at higher percentiles. This implies that teams in the lower conditional percentiles of revenues see a relatively higher contribution of other factors, such as away-game guarantees. The higher contribution of such factors makes intuitive sense, as teams that do unusually poorly will see a greater contribution from other schools, which are likely to do less poorly.

Estimates in Table 10.8 have much lower significance than in either of the preceding tables. *Draft* is significant only at the lowest two percentiles, *Rank* is significant only at the 35th percentile (and has the wrong sign), and *MSA* is significant only at the 35th and 50th percentiles. The lack of

Table 10.8 Estimates using Total Revenues ($n = 160$)

Variable	20%	35%	Median	65%	80%
<i>Draft</i>	77,031 (0.00)	111,345 (0.00)	103,452 (0.13)	133,886 (0.15)	146,280 (0.31)
<i>Rank</i>	381.71 (0.24)	520.69 (0.00)	928.26 (0.45)	1,153.45 (0.19)	1,849.91 (0.19)
<i>MSA</i>	-0.0061 (0.55)	-0.0314 (0.00)	-0.0411 (0.09)	-0.0487 (0.12)	-0.0124 (0.72)
Constant	143,922 (0.15)	226,965 (0.00)	390,896 (0.08)	553,293 (0.04)	773,121 (0.06)
Adjusted R^2	0.10	0.13	0.17	0.15	0.23

Note: p -values in parentheses; coefficients at lower than 10% level in bold; estimations include complete set of conference dummies.

significance makes intuitive sense, as total revenue includes a variety of items that are not related to the current performance of the team or its individual players. The significance of *Draft* at the lowest percentiles suggests that teams that have low revenues conditional on the independent variables rely more heavily on the drawing power of star players than do teams with unusually high conditional revenues.

10.4 SUBSIDIES AND TRANSFERS IN WOMEN'S NCAA BASKETBALL

Subsidies form an important part of revenues for women's intercollegiate sports. The subsidies are transfers from other parties, such as the student body, the university budget, or other profitable sports. The literature on the subsidization of women's college sports programs generally concentrates on the connection between women's programs and football programs. Leeds et al. (2004) show that a small amount of net revenues flow from college football to women's sports, while expenditures on football come at the expense of women's programs. The authors suggest that the net impact of a football program on women's sports expenditures is negative, unless the net revenues from football are extremely high. Specifically, schools tend to underfund women's programs, and even the most profitable football programs provide only small subsidies to women's sports programs.

Rishe (1999) shows that profits from college football increase expenditures per female student-athlete but reduce the proportion of all

expenditures on women athletes because the vast majority of football profit is funneled into men's sports. Agathe and Billings (2000) find evidence supporting a positive spillover of football success to other intercollegiate sports. Depken et al. (2011) show that very small and very large colleges with Division I football programs have greater women's college basketball attendance than schools that do not have them, with the greatest effect being for very small schools. If women's basketball attendance and revenues are positively correlated, this result implies that a football program augments women's basketball revenues for very small and very large schools.

In Table 10.4, which shows revenue by source for the unconditional quintiles, the two largest categories of indirect revenues are student fees and direct institutional support. Together, these sources constitute nearly 40 percent of team revenues in our sample. Table 10.4 shows that student fees and direct institutional support increase at an increasing rate at least up to the fourth quintile, both in absolute amount and as a percentage of total revenues. Teams in the first quintile depend heavily on ticket sales and away-game guarantees to fund their programs, averaging over 60 percent of their revenues from these sources; however, these two categories generate less than \$20,000 per team on average. None of the teams in the first quintile received revenues from student fees, and direct support made up only 8 percent of total revenues. Therefore, operational losses incurred by these teams would have been offset by other athletic funds, such as revenue from football or men's basketball.

Teams in the second quintile receive much more revenue from student fees and direct institutional support than teams in the first quintile. The sum of these two categories averages \$26,937 (23 percent of team revenues), slightly less than revenue from ticket sales (\$28,602) for this quintile. Third-quintile teams generate more in ticket revenues than second-quintile teams, but, again, much of the overall increase in revenue comes from outside the women's basketball program in the form of student fees and institutional support. On average, teams in the third quintile generate 34 percent of total revenues from student fees and direct institutional support. Teams in the fourth quintile receive over 50 percent of their total revenue from these outside sources. Teams in the highest quintile averaged \$208,313 in student fees and \$308,000 in institutional support, together comprising 37 percent of their total revenues. Although this percentage is considerably less than for fourth-quintile teams, it remains a large amount of resources transferred from non-women's-basketball sources.

We ran quintile regressions to assess the impact of premium women's basketball players on student fees and direct support. We do not present the results because the coefficients on *Draft* in all these regressions

were insignificant. The lack of significance suggests that student fees and institutional support are independent of a team's premium players, perhaps because the revenue was allocated prior to the 2004–05 season. Further, both of these revenue sources are generally determined through collective decision-making processes at the university, such as student referenda or decisions within the administration.¹ Given the complexity of collective decision-making processes, we cannot identify whether the revenues from student fees and institutional support represent non-market subsidies or a university's preferences towards women's basketball. For example, let us assume that student-fee allocations are determined through a student vote. On the one hand, student-fee revenues may represent the value that students (or the median student-voter) place on athletic programs. Alternatively, student-fee revenues may be the outcome of rent-seeking activities by special-interest groups. Similar reasoning pertains to the decision-making processes by which direct institutional support is allocated to particular programs; these revenues may be allocated based on the preferences of administrators or committees – appointed or elected – that reflect the preferences of interest groups.

Although it is difficult to determine whether student fees and institutional support for women's college basketball programs represent consumer demand or rent seeking, there is no doubt that these revenues represent transfers from one group to another. Furthermore, as Table 10.1 shows, the average women's basketball program had negative net revenues of over \$600,000, and nearly all women's 2004–05 NCAA Division I basketball programs were subsidized in some way. The lone exception was the University of Connecticut, a perennial women's basketball powerhouse.² Even considering student fees and institutional support as revenue rather than a subsidy, only 18 teams broke even or made a profit, with only four (Connecticut, Missouri State, South Alabama, and Eastern Kentucky) earning more than \$50,000. Thus, despite subsidies from students and universities, most NCAA Division I women's basketball programs lose money, even those programs that are successful on the court. If the 2004–05 season is representative of other years, it is reasonable to conclude that women's basketball programs are not self-supporting.

We now identify the ultimate recipients of the subsidies when a women's basketball program cannot support itself. Some of the subsidies flow to the current players as scholarships and athletic and academic support. Only 21 of the 160 schools in our data had direct revenue large enough to cover scholarships for women's basketball. The majority of women's basketball scholarship recipients receive scholarships in excess of what their teams generate in revenues. Thus, female college basketball players

are subsidized as a group, even though the best of them (that is, premium players) may generate excess revenues that are allocated to their peers.

As many studies point out (for example, Kahn, 2007), the monopsony structure of the market for college athletes allows for excess athletic revenues to be funneled to coaches. Only eight schools generate sufficient direct revenue to cover the median coaching salary of \$384,113: Connecticut, Texas Tech, Tennessee, Minnesota, Missouri State, Texas, New Mexico, and Kansas State.

We finish this section by peeling back the revenue breakdown for top-revenue teams, defined as those programs at or above the 95th percentile of the revenue distribution. On average, 48 percent of these teams' revenues were from ticket sales and contributions, 10 percent were from student fees, and 25 percent were from (direct and indirect) institutional support. Even the top teams exhibit wide differences across revenue categories. Nevertheless, the relatively high proportion of revenues from student fees and institutional support indicate that these top teams do not all produce sufficient revenue.

To illustrate, consider the revenue sources for some high-revenue teams. Eastern Michigan, the lowest-revenue team in this group with \$1,311,594 in total revenues, earned a mere 1 percent of its revenues from ticket sales. Student fees contributed 22.5 percent, with direct institutional support adding 44.5 percent, and indirect institutional support generating another 22 percent. SUNY-Binghamton earned slightly more in total revenues than Eastern Michigan, but it still received less than 5 percent of total revenue from ticket sales. Student fees comprised nearly 40 percent of SUNY-Binghamton's revenues, direct institutional support added over 18 percent, indirect institutional support added 28 percent, and government entities contributed nearly 7 percent. Missouri State, approximately in the middle of total revenues for these high-revenue schools, generated nearly 50 percent of its revenues from ticket sales and contributions, with another 31 percent from direct institutional support. The University of Texas, just above Missouri State in total revenues, produced over 60 percent of its revenues from tickets and contributions alone, illustrating that even high-revenue teams generate revenue in very different ways.

The University of Connecticut is in a league of its own. UConn generated nearly all of its \$5.5 million in revenue from ticket sales (76 percent); contributions (8 percent) and media rights (15 percent) were small by comparison. The next highest in total revenues was Texas Tech University, which took in just over \$4.1 million, 84 percent of which came from tickets sales and contributions, with student fees making up almost 10 percent. Clearly, UConn and Texas Tech can self-fund women's basketball. On the other hand, Rutgers University's women's basketball team was number

three on the total revenue list at over \$2.7 million, but it was also arguably the most highly subsidized program with over \$1.5 million (56 percent of its revenues) coming from direct institutional support; ticket sales and contributions comprised less than 20 percent of its total revenues.

10.5 CONCLUSION

This chapter adds to existing research on women's basketball by analyzing the components of women's basketball revenues. It investigates how the play of current student-athletes, the revenues they generate, and the revenues that can be attributed to other factors are interconnected. The MRP estimates in this chapter improve upon existing estimates because they demonstrate the revenue-generating potential of elite-level women's college basketball players more directly.

NCAA rules limit the amount of money that student-athletes can 'earn' on campus. Past research indicates that the best student-athletes in the revenue-producing sports of football and men's basketball generate extensive revenues for their schools' athletic programs, far in excess of what they receive during their four years of college eligibility. This chapter analyzes recent data on revenues and expenditures for NCAA Division I women's basketball programs. We find that premium women's basketball players generate revenues for their schools that are a fraction of those produced by the premium football and men's basketball players, thus validating past research. Specifically, we find that a premium female player generated between \$12,000 and \$200,000 in revenue in 2004–05, depending on the definition of revenue and the conditional percentile of the team's revenue.

The finding that the best women's basketball players generate revenues for their schools is not novel, nor is the finding that women generate less revenue than men. However, this study is the first to perform a deeper analysis of revenues and revenue sources in women's college basketball. We find that, in 2004–05, most programs in our sample (nearly 87 percent) did not generate enough revenues associated with current players (termed 'direct revenues' in this chapter) to fund the scholarships of those players. Thus, in a purely monetary sense, having women's basketball programs at these schools came at the expense of another group; whether it was students, other athletic programs, or academic programs, someone had to subsidize women's basketball scholarships at most NCAA Division I schools in 2004–05. The conclusion becomes stronger when coaches' salaries are taken into account. In that case, only eight programs funded themselves out of direct revenues in 2004–05. The remaining 95 percent

of schools used other revenue sources to fund their women's basketball programs.

The recent suggestion by the NCAA to pay student-athletes a \$2,000 stipend has led to a renewed debate of the merits of the pay-for-play model in college athletics. Although the issue of amateurism may be the thorniest part of the discussion (with the possible legal problems associated with categorizing student-athletes as employees), the concept of the 'revenue-generating student-athlete' forms the core of the argument for paying college athletes. The NCAA reports that a full athletic scholarship in 2009 was worth approximately \$15,000 for an in-state student at a public university, \$25,000 for an out-of-state student at a public university, and \$35,000 at a private university (NCAA, 2011). In men's basketball and football, the best players generate well in excess of these amounts, and paying athletes in the revenue-generating sports would imply a seismic shift in the business model of college athletics. Finding adequate sources for funding pay-for-play in non-revenue sports could prove an even bigger adjustment. Given that men's basketball and football subsidize other sports, administrators would have to find new sources of support for non-revenue sports.

This chapter shows that most Division I women's basketball programs are implicitly or explicitly subsidized and do not generate sufficient revenues to support themselves. Thus, any policy that increases the payment to women's basketball players must consider the source of existing subsidies. If teams in revenue-producing sports begin to pay their own players an amount based on their MRPs, then rents to fund subsidies from athletic budgets to women's basketball programs would necessarily be reduced. In order for schools to maintain compliance with Title IX, subsidies from other sources (such as student fees) would likely be increased for women's basketball to offset a decrease in athletic transfers. But at least women's basketball generates some revenues; the impact of a reduction in transfers from revenue-producing sports would have a much greater effect on sports that generate little or no revenues.

NOTES

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1. Students at three California universities voted against higher student fees to support intercollegiate athletics (Clotfelter, 2011).
2. For more on the dominance of some women's basketball programs, see Chapter 12 in this volume.

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APPENDIX 10A

Table 10A.1 *Revenue category definitions*

Category	Definition
Ticket sales	Sales of admissions to athletics events, including ticket sales to the public, faculty and students, and money received for shipping and handling of tickets
Student fees	Student fees assessed for support of (or that portion of overall fees allocated to) intercollegiate athletics
Guarantees	Revenues received from participation in away games
Contributions	Amount received (in cash or in kind) from any individual or group that is designated, restricted, or unrestricted by the donor for the operation of the athletics program. Also, amounts paid in excess of a ticket's value
Third party support	Amount provided by a third party and contractually guaranteed by the institution, but not included on the institution's W-2 (e.g., car stipend, country club membership, entertainment allowance, clothing allowance, speaking fees, housing allowance, compensation from camps, radio income, television income, or shoe and apparel income)
Direct government support	State, municipal, federal, and other government appropriations made in support of the operations of intercollegiate athletics
Direct institutional support	Amount of institutional resources used for the current operations of intercollegiate athletics, including all unrestricted funds allocated to the athletics department by the university
Indirect support	Value of facilities and services provided by the institution not charged to athletics
NCAA/conf. distributions	Revenues received from participation in bowl games and tournaments, and from all NCAA distributions, including amounts received for direct participation or through a sharing arrangement with a conference
Broadcast rights	Revenues received directly for radio/TV broadcasts, Internet, and e-commerce rights
Game day sales	Revenues from game programs, novelties, food or other concessions, and parking
Royalties and advertising	Revenues (both in cash and in kind) from corporate sponsorships, sales of advertisements, trademarks, and royalties
Sports camps	Revenues received by the athletics department for sports camps and clinics
Investment income	Endowment distributions and other investment income in support of the operations of intercollegiate athletics
Other revenues	Miscellaneous revenues (less than 5% of total revenues may appear on this line)

Source: *Indianapolis Star*, April 1, 2006.