WESTERN KENTUCKY UNIVERSITY'S ATHLETIC PROGRAM:
FINANCIAL BURDEN OR BOON?*

by

Robert W. Pulsinelli
Melvin V. Borland
Brian L. Goff

Department of Economics
Western Kentucky University

*We gratefully acknowledge helpful comments and suggestions from some of our colleagues in economics and accounting.
SUMMARY

We believe that the information supplied by traditional university accounting procedures regarding college athletics is inadequate for decision-making purposes. Consequently, we have developed an economic model based on managerial accounting, which considers only the marginal costs and the marginal revenues attendant to a decision. Note that the word marginal means "extra", or "incremental".

In particular, our concern was with whether or not the entire athletic program, and each particular sport within that program, was a net revenue contribution or a net revenue absorber. The question posed was: if a particular sport (or all sports) had been cancelled prior to the 1988-89 school year, what would have happened to WKU's total costs and total revenues in that year? If total revenues would have fallen by less than total costs, then the particular program is operating at a loss; if total revenues would have fallen by more than total costs (in the absence of the sport considered), then that sport is a net revenue contributor.

Our model indicates that if a sport were cancelled, total revenues would fall due to

a) direct revenue reductions (when relevant) resulting from loss of ticket sales, guarantees, post-season-play monies and so on,

b) revenue which would have emanated from the athletes themselves, such as (i) state formula funding appropriations, and (ii) tuition or partial tuition payments from athletes who receive less than full grants-in-aid. (Our assumption is that if athletes had not received various grants-in-aid they would not have attended WKU).

c) enrollment enticing effects on non-athletes who pay tuition and for whom the state appropriates money to WKU (through formula funding). (Note: We estimate only the effects of the football team and the men's basketball team on WKU's enrollment).

Of course, if a particular sport had been eliminated prior to the 1988-89 school year, WKU's total costs would have fallen also. The text of our paper
specifies in detail, for each sport, which costs are considered. Here we merely note that we did not consider that the reduction in tuition grants-in-aid to athletes would reduce WKU's costs because (1) WKU is not operating at full capacity and hence those 200 or so athletes impose no marginal costs on the University (empty chairs are available in most classes, and no new buildings need be built nor new faculty hired to accommodate them; similarly if such student athletes were to depart, WKU would not save money through faculty lay-offs and building cost reductions); and (2) we assume that student athletes would not attend WKU were it not for the particular sport; hence WKU cannot suffer opportunity costs in foregone tuition revenues because it wouldn't have received those revenues in the first place. That is, WKU cannot "lose" revenues that it would not have received.

For the 1988-89 school year, we estimate that if no athletic program were in place, WKU's total costs would have fallen by $330,036 more than its total revenues would have fallen. Thus, Western's athletic program was an apparent net drain on University resources. On the other hand, in order to break even, the athletic program need only have attracted about 80 students to the University. In fact, we estimate that the football team and the men's basketball team attracted about 1459 non-athletes who brought revenue to the University in tuition and state appropriations. Therefore, taking this into account, the athletic program contributed over $5.75 million to net revenues.

For that same school year we estimate that had there been no football team WKU's total costs would have fallen by $245,209 more than its total revenues would have fallen; to that extent football is an apparent net drain on the University's resources. However, the football team needed to attract only about 59 students to break even. Our model estimates that in 1988-89 the football team attracted 341 students. On balance, therefore, the football program contributed over $1.17 to WKU's net revenues.
SECTION 1: INTRODUCTION

In recent years college athletics, due to a confluence of scandals, drug use allegations, and apparent budget overruns, have come under attack. This unrest is a nationwide phenomenon, and Western Kentucky University is no exception. Fearing that athletes are being exploited (or pampered, depending on who is doing the talking) and believing that athletic budgets absorb university resources that are better spent elsewhere, some WKU faculty members have called for a reduction in the scale of Western's athletics.

In this report we do not come to grips with all (or even most) of the various issues. Instead, we concentrate on the financial aspects of Western's athletic program. We believe that one reason for the widely-held belief that college athletic programs in general, and college football in particular, are financial drains on the University results from concentrating on one particular notion of the concept "budget deficit." Some people define a budget deficit as the excess of actual expenditure outlays above budget allocations. Then they use the concept "budget deficit" to refer to the excess of total costs above total revenues, a quantity more commonly referred to as losses.

A moment's reflection will indicate that the more relevant concept is the second--losses. For instance, consider a firm that produces automobiles and suddenly decides to create a new division to manufacture a car to compete in the Indy 500. Suppose the new division is allocated a budget of $1 million, but actually spends $2 million (which the parent company "covers"). On the other hand, suppose this division generates an estimated $4 million increase in earnings to the parent company (perhaps because of the advertising and goodwill generated by its new activities). Although the new division has a
budget deficit of $1 million, it nevertheless has contributed to the company net profits of $2 million = $4 million - $2 million. Suppose that next year the new division is allocated a $2 million budget and spends $4 million but generates earnings of $8 million. Its budget deficit has doubled (to $2 million), but its contribution to net profits also has doubled (to $4 million). Even though its budget deficit has doubled, the new division has become more profitable to the company.

In short, budget deficits are quite irrelevant. What really matters for a particular division (i.e., the athletic program or the football program) is how its correctly defined total revenues compare with its correctly defined total costs, which is the subject of Section 2.

After having done our empirical investigation, we now believe that despite the conventional wisdom, WKU's (and in all probability similar school's) athletic program makes a net contribution to the University's financial situation. Indeed, most of WKU's individual sports, including football, bring in more revenues than they absorb. Because this result is so at odds with what so many others have concluded (including, it would seem, university budget and athletic directors) we present our economic model in detail in the next section.

SECTION 2: THE MODEL

In this section we present our economic model. As indicated in Section I, our concern, essentially, is with the financial aspects of college athletics at Western Kentucky University. Is WKU's athletic program a financial success, or is it a net drain on the University's resources? Is the football program self-financing or not?

The analytical approach taken to answer such questions is as follows. Assume that WKU is a business enterprise and that the chief executive officer
wants to know if the athletic program as a whole, and if each individual sport within that program, is paying its own way.

**MARGINAL COST AND MARGINAL BENEFIT**

Economists and other developers of the discipline of decision-making science are in agreement that when making a decision one should compare only the marginal costs (MC) and the marginal benefits (MB) associated with the decision at hand.\(^1\) If \( MB > MC \), then engage in the activity; if \( MB < MC \), then do not engage in the activity; if \( MB = MC \), then one is indifferent. Note that the word "marginal" means extra, or incremental.

**Marginal Costs.** It is important to distinguish between marginal costs and fixed (or sunk) costs. MC includes only those costs that vary with the decision at hand; costs that do not vary with the specific decision (i.e., costs that must be incurred whether or not the decision is made) are sunk and, consequently, are irrelevant.

For example, a restaurant owner (who offers only dinner) faced with the decision of whether or not to open for lunch should not allocate a portion of her monthly rent or mortgage payments when assessing the costs to her of serving lunch. Such costs are incurred whether or not she opens for lunch; because they do not vary with the decisions at hand, they are sunk costs and are irrelevant to this decision. To the extent that the owner did (arbitrarily) allocate sunk costs, she would be biasing her decision against opening then and would not be maximizing profits. The restaurant owner should include in MC the following: costs of goods sold, extra waitress salaries,

\(^1\)See Skousen and Condie (1988) for a similar evaluation of athletics at Utah State University.
extra pay to managers, the extra (or increased) utilities expense\(^2\), and so on.

Some important distinctions must be made between marginal and sunk costs used in our model. Because we are considering WKU as it now exists, the football stadium, basketball arena, baseball field, and so on are already in place; hence any mortgage payments on such buildings are sunk (irrelevant), costs. MC includes only the maintenance resulting from annual use. Moreover, because WKU is not operating at full capacity, the MC of its accepting an additional student is close to zero; no new buildings need be built, empty seats are available during lectures, and no additional faculty need be hired to accommodate one more student. The excess capacity at WKU is evidenced in several ways. Empty halls and classrooms in the afternoons and on Saturdays is one. Empty chairs in existing classes is another. Also, continuing enrollment increases suggests available capacity. The fact that some individual sections may be at or near capacity or the fact that faculty would prefer to have smaller classes does not alter the conclusion that excess capacity is present.

Thus, if WKU gives a tuition scholarship to a student athlete (or to a non-athlete), then this is practically costless to the school—*if the student would not have attended WKU without the scholarship*. That is, if the student athlete would have enrolled at WKU regardless of whether or not a scholarship were awarded, then WKU suffers an opportunity cost in foregone revenues; under that condition tuition loss should be counted as a MC. If the student athlete would have enrolled at WKU only if he or she had received a tuition scholarship, however, then there is no opportunity cost and the MC = 0; WKU cannot "lose" revenues that it would not have received. Similarly, food

\(^2\)If the monthly utility bill rises from $1000 to $1100, then the owner should allocate $100 per month to the utilities portion of lunch MC; if management salaries must rise from $3000 per month to $3300 per month, then $300 per month is included in lunch MC.
grants-in-aid must be scrutinized to obtain the true MC to the university. For a student who would not attend the university without the food scholarship, the university does not "save" the entire retail price of the food by deciding to withhold the scholarship. Instead, the university saves only the cost of the food (given that preparation time is unaffected by an additional student). At WKU the food costs, on average, is about 40 percent of the retail price of the item. Another example concerns a room (or dorm) grant to a student athlete. If the dorm is not 100 per cent occupied, then the MC of such a scholarship is close to zero; only the extra increase in utilities should be considered as MC. Note that because WKU residence halls are presently 100 per cent occupied, a dorm scholarship does impose a MC on the University; a student athlete replaces a paying student in the dorm and therefore WKU experiences an opportunity cost equal to the dorm rental.  

It should be noted that a given cost is marginal for some decisions, while sunk for others. For example, if WKU were to eliminate the entire athletic program, the salaries of the athletic director and the trainers would be eliminated, and MC would fall by such amounts. On the other hand, if just

3Note that an argument can be made that a 100 per cent dorm occupancy rate is a *prima facie* argument that dorm rentals are "too low"—in the sense that a higher rent would increase net revenues to WKU. After all, no hotel or motel chain strives for 100 per cent occupancy; optimal pricing requires some excess capacity. WKU, in fact, charges a below market rent, that is the lowest of any of the Kentucky universities. Furthermore, WKU has chosen to limit dorm room occupancy to one or two students. To the extent that three students can (and, indeed in the past, have) inhabit one dorm and to the extent that WKU permits one-person occupancy in dorm rooms at a price that is considerably less than twice that of two-student rooms, one could legitimately question whether 100 percent capacity for dorms exists. Nevertheless, to be conservative we include the dorm rentals as a MC in our model.

4An important example is the cost of athletic buildings. If the institution decides to build another building (or replace the existing one) then this should be considered as a MC. One should estimate the present value of the future benefits and the present value of the total costs (including the cost of the building) over the life of the building. Thus mortgages are a marginal cost in the long run, but not in the short run.
one sport were eliminated from the athletic program, then it is unlikely that the athletic director's job would be eliminated; his or her salary would be a sunk cost. (Note: If, say, football were eliminated, then WKU might be able to hire an athletic director for less money and MC would fall by the salary difference. We deem a salary reduction in such an event to be too speculative to estimate.) We should treat trainer salaries (but not training expenses) in a similar fashion: MC falls by the salary amounts when the decision is made to eliminate the entire athletic program, but MC is unaffected (with respect to salary) when an individual sport is considered for termination. For ease of exposition, however, we allocate the entire training expense to basketball and football. Exhibit 1 is a list of athletic budget line-item entries we considered as potential candidates for MC changes in the various phases of our model; Exhibit 2 indicates specific costs attributable to the athletic program.

Marginal Benefits

Marginal benefits are defined as the change in total benefits directly attributable to the decision at hand. We limit our calculations of marginal benefits to the change in total revenues subsequent to a particular decision. For example, we estimate the MB of the entire athletic program as the reduction in total revenues to WKU as a result of eliminating that program. Exhibit 3 indicates the sources and specific values of such revenues for 1988-89. (Of course when an individual sport is analyzed, only the relevant marginal revenues are considered.)

WKU is a state institution; therefore it receives revenue from the state when it extends scholarships to athletes (and non-athletes). Because our analysis is from Western's point of view--not the state's--total revenues would fall if WKU eliminated all or any of its athletic programs. The exact
**EXHIBIT 1**

**Line-item categories of costs included in athletic budget figures:**

<table>
<thead>
<tr>
<th>Costs Category</th>
<th>Costs Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries-Regular</td>
<td>Office Supplies</td>
</tr>
<tr>
<td>Salaries-Administrative</td>
<td>Janitorial and Maintenance Supplies</td>
</tr>
<tr>
<td>Salaries-Student</td>
<td>Rec, Athletic, Theatre, &amp; Music Supplies</td>
</tr>
<tr>
<td>Employer's FICA</td>
<td>Photographic and Related Services</td>
</tr>
<tr>
<td>Employer's Retirement-KTRS</td>
<td>Data Processing Supplies</td>
</tr>
<tr>
<td>Employer's Health Insurance</td>
<td>Other Supplies and Parts</td>
</tr>
<tr>
<td>Employer's Life Insurance</td>
<td>Food Products</td>
</tr>
<tr>
<td>University Disability Coverage</td>
<td>Furniture-Office Equipment</td>
</tr>
<tr>
<td>Workmen's Compensation</td>
<td>In-State Travel</td>
</tr>
<tr>
<td>Faculty/Staff Tuition Scholarship</td>
<td>Travel for non-state employees</td>
</tr>
<tr>
<td>Uniforms (rentals and purchases)</td>
<td>Coaches' Travel</td>
</tr>
<tr>
<td>Honoraria</td>
<td>Team Travel</td>
</tr>
<tr>
<td>Maintenance of Equipment</td>
<td>Game Guarantees to visiting teams</td>
</tr>
<tr>
<td>Postage and Post Meters</td>
<td>Game Officials</td>
</tr>
<tr>
<td>Freight</td>
<td>Subscriptions</td>
</tr>
<tr>
<td>Other Parcel Delivery Service</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td>Printing</td>
<td>Grant-in-aid (Food)(^a)</td>
</tr>
<tr>
<td>Printing Paid to Vendor</td>
<td>Grant-in-aid (Books)</td>
</tr>
<tr>
<td>Laundry and Cleaning</td>
<td>Grant-in-aid (Rent)</td>
</tr>
<tr>
<td>Telephone-to Vendor</td>
<td>Grant-in-aid (Reg. Fees)</td>
</tr>
<tr>
<td>Telephone-Long Distance</td>
<td>Buildings and Fixed Equipment</td>
</tr>
<tr>
<td>Overtime pay to security officers</td>
<td>Athletic Equipment</td>
</tr>
</tbody>
</table>

\(^a\) We estimate only the cost to WKU, not the retail value.
EXHIBIT 2

Costs of Athletic Programs, 1988-89\(^a\) \(^b\)

<table>
<thead>
<tr>
<th>Division</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletic Director</td>
<td>$156,636</td>
</tr>
<tr>
<td>Trainer</td>
<td>234,614</td>
</tr>
<tr>
<td>Football</td>
<td>623,227</td>
</tr>
<tr>
<td>Men's Basketball</td>
<td>487,037</td>
</tr>
<tr>
<td>Baseball</td>
<td>101,769</td>
</tr>
<tr>
<td>Track &amp; Field</td>
<td>59,488</td>
</tr>
<tr>
<td>Men's Tennis</td>
<td>14,682</td>
</tr>
<tr>
<td>Men's Golf</td>
<td>24,501</td>
</tr>
<tr>
<td>Swimming</td>
<td>30,520</td>
</tr>
<tr>
<td>Soccer</td>
<td>9,433</td>
</tr>
<tr>
<td>Women's Basketball</td>
<td>283,462</td>
</tr>
<tr>
<td>Women's Golf</td>
<td>21,908</td>
</tr>
<tr>
<td>Women's Tennis</td>
<td>11,822</td>
</tr>
<tr>
<td>Women's Volleyball</td>
<td>55,045</td>
</tr>
<tr>
<td>Maintenance Man-hour and Materials Costs</td>
<td>77,333</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,191,477</strong></td>
</tr>
</tbody>
</table>

\(^a\)Note that tuition grant-in-aids are not counted.

\(^b\)Food grant-in-aids are at 40% of listed expenditure.

**Source:** WKU Detailed Statement of Current Funds-Realization of Revenues for the Period July 1, 1988 to June 30, 1989, WKU Office of Budgetary Control. Maintenance Man-hour and Materials costs information were provided by the Physical Plan Administrator. Allocations were made to Football, Basketball (suballocated by us based on relative attendance), Baseball, Soccer, Volleyball, and Track.
## EXHIBIT 3

Revenues Attributable to WKU Athletic Programs, 1988-89

<table>
<thead>
<tr>
<th>Division</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Fees</td>
<td>$571,925</td>
</tr>
<tr>
<td>Basketball Ticket Sales</td>
<td>285,955</td>
</tr>
<tr>
<td>Football Ticket Sales</td>
<td>85,697</td>
</tr>
<tr>
<td>Other</td>
<td>3,714</td>
</tr>
<tr>
<td>Basketball Guarantees</td>
<td>45,349</td>
</tr>
<tr>
<td>Football Guarantees</td>
<td>110,510</td>
</tr>
<tr>
<td>Radio Network</td>
<td>5,500</td>
</tr>
<tr>
<td>Basketball (women) Ticket Sales</td>
<td>18,890</td>
</tr>
<tr>
<td>Insurance Reimbursement</td>
<td>36,589</td>
</tr>
<tr>
<td>Concessions (net)</td>
<td>39,000</td>
</tr>
<tr>
<td>Food Service (est.)</td>
<td>7,800</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,210,929</strong></td>
</tr>
</tbody>
</table>

**Source:** WKU Detailed Statement of Current Funds - Realization of Revenues for the Period July 1, 1988 to June 30, 1989. WKU Office of Budgetary Control.
amount by which revenues would fall is determined by a state formula funding equation. In general the exact reduction in revenues depends on the number of athletes who are in-state and out-of-state residents, and on the specific courses taken by such students. For each of our decision categories, we estimate (a) a minimum reduction in total revenues and (b) a typical reduction in total revenues based on the assumption that athletes pursue a course of study not atypical from that of non-athletes--with respect to state formula funding.

Assuming 32 student credit hours per student per year and assuming that students take those courses that generate the least money from formula funding, we obtain a minimum estimate for the total revenue reduction from this source at $1866.57 per in-state student and at $174.07 for each out-of-state student. The total revenue reduction in formula funding from student athletes for the typical case (assuming that students take the normal courses) is $2956.21 for each in-state student and $1263.72 for each out-of-state

In its most recent statement the Council on Higher Education has recommended an accelerated movement toward full formula funding. Currently, however, to protect the base budgets of some institutions, the Council has maintained allocations for each institution at least at the actual base level appropriation for those institutions plus continuation. To the extent that progress toward full formula funding would not damage the base level budget at Western Kentucky University, appropriations are determined, though at less than 100%. As such, the marginal revenue for students at Western Kentucky University can be calculated according to the formula discounted by the percent of full formula funding that appears as actual appropriation.

Another (minor) variable is the number of freshman and sophomores with composite ACT scores below 12; the state provides (to the University) under full formula funding $260 for each such student. To estimate the mathematical expected value of this entity, we calculate the probability that the next scholarship recipient has an ACT score less than 12 and multiply that probability times $260.

What matters for our purposes is whether the state allocations for the typical courses taken by athletes is different from the allocations for the typical courses taken by non-athletes--and not whether the actual course of study is different for the two groups. We estimate state formula funding allocations in the typical case by calculating the probability of the additional students' taking courses from each WKU study area (based on WKU student experience) and multiplying the respective probabilities times the formula funding allocation for each study area.
student. 8 (Note, we were provided information regarding the in-state/out-of-state status of each student athlete.)

We also consider as a marginal revenue the fact that many student athletes receive only partial tuition scholarships, or receive non-tuition scholarships but pay tuition. Because this information exists for each sport, we are able to calculate these marginal revenue effects. Thus, even if a non-revenue generating sport such as tennis is terminated, WKU's total revenue would fall. Total revenues would fall due to (a) a reduction in the formula funding allocation from the state for each student athlete (as indicated above) and (2) a reduction in tuition payments made by some athletes themselves. (Note: By assumption such students would not have attended WKU in the absence of the relevant sport.) One of our more interesting findings is that for some of the "non-revenue generating" sports, total revenues to WKU would fall faster than total costs to WKU if those sports were dropped. 9

Another source of marginal revenue comes from the effects on enrollment of the athletic program. To the extent that enrollment is a function of the existence (or the won/loss record) of the athletic program, such total revenue changes should be considered.

8 MR from this source equals state allocations from: instruction (the minimum rate is for lower and upper division courses in liberal arts), plus community service plus academic support/libraries, plus preparatory education (see footnote 6), which subtotals $3294.63, minus a deduction for tuition (irrespective of the existence of an actual tuition payment to the university), minus a deduction for "investment income" (equal to 30 per cent of 7.25 per cent of tuition). Thus, per student net minimum state funding is $2211.57 = $3294.63 - $1083.06; WKU's per student appropriation is 84.4 per cent of that figure, or $1866.57, for resident students, via formula funding.

9 One implication of this finding is that if WKU increased its number of tuition scholarships in such sports to the number allowed by the Sun Belt Conference (and the NCAA), its total revenues would rise faster than would its total costs. As a consequence, individual "non-revenue" sports would earn more "profits" or suffer smaller losses.
For each in-state and out-of-state student attracted to WKU by the relative performance of its football and men's basketball teams, we estimate (a) state formula funding appropriation (minimum and typical, as above), and (b) registration fees (exclusive of the $30 student athletic fees which are already included in athletic revenues, in Exhibit 3). For each resident student thereby attracted, the minimum revenue generated to WKU is $3019.62, and the typical revenue generated is $4109.27. For each out-of-state student attracted by those sports, the minimum revenue gained by WKU is $3493.23, and the typical revenue gain is $4582.88.

In section 4 we analyze the effects on enrollment of WKU's football and men's basketball programs. Note that no attempt was made to estimate the enrollment effects of the other programs; nor have we estimated the revenues gained by WKU as a result of "walk-ons" in the non-revenue generating sports. To the extent that such revenue-generating effects exist (and they may be relatively important for some of the minor sports), our model is biased against the self-financing ability of those sports. Also, we do not include revenues and expenditures of the Hilltopper Athletic Foundation. These amounted to over $600,000 in 1988-89. Over 40% of this amount was spent directly on recruiting and scholarship expenses. We exclude this revenue because they are held in essentially off-budget accounts and the revenues are equal to expenditures. The net effect for the University is 0. However, WKU has 21 "endowed" scholarships which are or will be funded at levels of $35,000 or more each. Once funded fully, the interest from these endowments will accrue to the university and represent net revenues because the scholarships have marginal costs close to 0. We also do not include revenues from parking or bookstore sales attributable to athletics.
SECTION 3: MODEL APPLICATIONS

We apply our MR/MC model to an analysis of the economic impact (in the school year 1988-89) of not having: the entire athletic program, the football program, men's basketball, women's basketball, baseball, men's tennis, women's tennis, men's golf, women's golf, soccer, women's volleyball, men and women's track and field, and swimming.

The Entire Athletic Program

What would have happened in the school year 1988-89 had there been no athletic program? As Exhibit 4 shows, total costs, found from summing the entries in Exhibit 2, would have fallen by $2,191,477. On the other hand, total revenues from three basic sources would have fallen. First, direct total revenue, found in Exhibit 3, would have fallen by $1,210,929. Second, revenues would have fallen because the student athletes themselves would not be at WKU; Western would have lost revenues from state formula funding and net (of student athletic fees) registration fees paid by student athletes. Revenues would have fallen at a minimum (assuming students would have taken only the "cheapest"--from the state's formula funding--courses) by $376,471; if student athletes take the typical courses then revenues would have fallen by $650,512. The net subtotal (assuming the typical scenario) is $1,861,441 = $1,210,929 + $650,512. To this point in our analysis, WKU is losing (i.e., its marginal costs exceed its marginal revenues) $330,036 for that school year. However, the athletic program in general (and men's basketball and football in the main) induces students to enroll at WKU. In order for WKU to break even on its entire athletic program, that program would have to attract only 79.5 students. We return to this issue in Section 4.
EXHIBIT 4
The Entire Athletic Program

A. Marginal Costs
   From Exhibit 2 $2,191,477

B. Marginal Revenues
   (i) From Exhibit 3 $1,210,929
   (ii) From Student Athletes
        Formula funding plus net registration\textsuperscript{a}
             Minimum $376,471
             Typical $650,512
   (iii) Enrollment Impact on Revenues\textsuperscript{e}
         Typical $6,089,866

\textsuperscript{a}Net of student athletic fees.
\textsuperscript{b}1,118 from men's basketball, and 341 from football multiplied by typical student formula funding plus registration tuition and fees (less athletic fees.)
Football

Exhibit 5 indicates the financial effects of WKU's not having a football team (other things constant) in the 1988-1989 school year. Marginal costs would have fallen by $117,307 from a saving in trainer costs. Additionally, marginal costs would have fallen by another $649,439 (See Exhibit 2), for a total cost reduction of $766,746.

Total revenue, however, would have fallen by $335,291, from Exhibit 3. Additionally formula state funding revenues and net registration revenues from football players themselves would have fallen by $89,270 at a minimum, and by $186,246 had football players taken the typical (see footnote 7) courses. The subtotal from these two sources is $521,537 = $335,291 + $186,246 (assuming the typical scenario). At this point in our analysis, football costs would have fallen by $766,746, and football revenues would have fallen by $521,537, for a net loss of $245,209.

In order to break even, therefore, the football program would have to increase (non-football player) student enrollment by about 59 students. We analyze the enrollment-enhancement effects of the football program in Section 4. We pause here merely to stress that a net loss of $245,209 generated by the football program is a much lower figure than is commonly believed. It follows that a break-even point of 59 enrollment-enhanced students associated with the football team in also a very small number.

Men's Basketball

Exhibit 6 indicates the financial impact of the men's basketball team for the 1988-89 school year. Had there been no basketball team, total costs would have fallen by $573,634 (see Exhibit 2).

Exhibit 2 indicates that total trainer's costs equal $234,614; to be conservative we allocate 50% of that entire figure to football even though (a) some trainer salary costs may be sunk and (b) football players are about 32% of the total number of student athletes.
### EXHIBIT 5

Football

**A. Marginal Costs**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainer (^a)</td>
<td>$117,307</td>
</tr>
<tr>
<td>From Exhibit 2</td>
<td>$649,439</td>
</tr>
<tr>
<td>Total</td>
<td>$766,746</td>
</tr>
</tbody>
</table>

**B. Marginal Revenues**

(i) From Exhibit 3

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ticket Sales</td>
<td>$85,697</td>
</tr>
<tr>
<td>Guarantees</td>
<td>$110,510</td>
</tr>
<tr>
<td>Student Fees (^b)</td>
<td>$125,824</td>
</tr>
<tr>
<td>Net Concessions (^e)</td>
<td>$13,260</td>
</tr>
<tr>
<td>Radio</td>
<td>NA</td>
</tr>
<tr>
<td>Parking</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$335,291</td>
</tr>
</tbody>
</table>

(ii) Revenues from Team Members

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula funding plus net registration (^c)</td>
<td>$117,307</td>
</tr>
<tr>
<td>Minimum: $89,270</td>
<td>Typical: $186,246</td>
</tr>
</tbody>
</table>

(iii) Enrollment Impact on Revenues \(^d\)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula funding plus net registration (^c)</td>
<td>$85,697</td>
</tr>
<tr>
<td>In state $1,205,005</td>
<td>Typical: $1,423,749</td>
</tr>
<tr>
<td>Out of state $1,923,749</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$1,423,749</td>
</tr>
</tbody>
</table>

\(^a\)We allocate 50% of total trainers costs to football; the ratio of total football players to total student athletes is approximately 32 percent.

\(^b\)The ratio of football ticket sales to total ticket sales (22%), times total student fees of $571,925. See Exhibit 3.

\(^c\)Net of student fees.

\(^d\)Our estimated enrollment impact (341 students) is allocated 86% in state and 14 percent out of state—the same as the overall student proportion.

\(^e\)We allocate 34 percent of net concessions to football based on attendance.
### EXHIBIT 6

**Men's Basketball**

#### A. Marginal Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (in $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainer</td>
<td>58,654</td>
</tr>
<tr>
<td>Total</td>
<td>573,634</td>
</tr>
</tbody>
</table>

#### B. Marginal Revenues

1. **(i) From Exhibit 3**
   - Ticket Sales: 285,955
   - Guarantees: 110,510
   - Student fees: 417,505
   - Net Concessions: 17,550
   - Radio: NA
   - Parking: NA
   - Total: 831,520

2. **(ii) Revenues from Team Members**
   - Formula funding plus net registration: $58,654

   **Minimum:** $5,690  
   **Typical:** $23,124

3. **(iii) Enrollment impact on Revenues**
   - Formula funding plus net registration: $514,980

   **Typical:**
   - In-state: $3,950,721
   - Out-of-state: 717,174
   - Total: 4,667,895

---

*a* 25 percent of total training costs  
*b* The ratio of men's football ticket sales to total basketball and football tickets sales (73 percent) times total student fees.  
*c* Mens basketball accounts for about 45 percent of total men's and women's basketball plus football; 45 percent of total net concessions equals $17,550. This is based on relative attendance.  
*d* Net of student athletic fees.  
*e* We estimate that in this year 1,118 students were induced to enroll due to the men's basketball program; 86 percent are assumed to be in state, and 14 percent out of state.
Total revenues would have fallen by $831,520 from direct (see Exhibit 3) sources. Formula funding and net registration revenue losses emanating from the members of the men's basketball team itself would have been $5,690 at a minimum, and would have been $23,124 under the typical scenario. The subtotal revenue loss (under the typical scenario) is $854,644, which exceeds the total cost reduction of $573,634. Thus, the men's basketball program is a net revenue producer of $281,010, even before enrollment effects are included. We analyze such effects in Section 4.

Women's Basketball

The financial analysis of the women's basketball team is contained in Exhibit 7. Had there been no women's basketball team in the 1988-1989 school year (other things constant), total costs (from Exhibit 2) would have fallen by $363,196.

Total revenues would have fallen by about $55,676 (from Exhibit 3), and by $17,538 at a minimum or by $34,972 under the typical scenario (from state formula funding and net registration fees from the members of the women's basketball team itself). At this point in the analysis, under the typical scenario, the women's basketball team's MC exceed its MR by about $272,548 in the 1988-1989 year. In order to break even that program needed to attract about 65 (non-women's basketball) students in that year. At this time we have not estimated the women basketball team's enrollment effect.

Baseball

Exhibit 8 presents the financial information concerning WKU's baseball team. Had there been no baseball team, total costs would have fallen by $102,595 (from Exhibit 2) and total revenues would have fallen (from revenues
### EXHIBIT 7

**Women's Basketball**

#### A. Marginal Costs

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainer&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$58,654</td>
</tr>
<tr>
<td>From Exhibit 2</td>
<td>$304,542</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$363,196</strong></td>
</tr>
</tbody>
</table>

#### B. Marginal Revenues

(i) From Exhibit 3

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ticket Sales</td>
<td>$18,890</td>
</tr>
<tr>
<td>Student Fees&lt;sup&gt;b&lt;/sup&gt;</td>
<td>$28,596</td>
</tr>
<tr>
<td>Net Concessions&lt;sup&gt;c&lt;/sup&gt;</td>
<td>$8,190</td>
</tr>
<tr>
<td>Radio</td>
<td>NA</td>
</tr>
<tr>
<td>Parking</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$55,676</strong></td>
</tr>
</tbody>
</table>

(ii) Revenues from Team Members

Formula funding plus net registration<sup>d</sup>

| Minimum: $17,538 | Typical: $34,972 |

---

<sup>a</sup>25 percent of total trainer costs.

<sup>b</sup>The ratio of women's basketball ticket sales to total ticket sales is about 5 percent.

<sup>c</sup>Attendance at women's basketball was about 21 percent of total basketball and football attendance.

<sup>d</sup>Net of student athletic fees.
EXHIBIT 8
Baseball

A. Marginal Costs
   From Exhibit 2 $102,595

B. Marginal Revenues
   (i) From Exhibit 3 NA
   (ii) Revenues from Team Members
        Formula funding plus net registration¹
        Minimum $57,435
        Typical $86,856

¹Net of student athletic fees.
generated by the team itself) by $57,435 at a minimum or by $86,856 under the typical scenario.

Thus, had there been no baseball team, WKU's costs would have fallen by $15,739 more than its revenues would have fallen. In order to break even, the baseball team would have had to entice 3.8 students to WKU.

Men and Women's Track and Field

Exhibit 9 contains the relevant information concerning men and women's track and field (which we were forced to combine due to data limitations). Marginal costs, from Exhibit 2, were $59,538. Marginal revenue from formula funding plus net registration, which emanates from team members themselves, is $66,036 at a minimum, or $106,352 under the typical scenario.

It is perhaps surprising that such a "non-revenue" sport actually contributes significantly to WKU's net revenues. One reason is that this sport has a relatively high proportion of athletes who are in-state residents; state support is considerably higher for such students. One possible conclusion would be that (at least with respect to finances) a coach should prefer to offer scholarships to in-state students over out-of-state students, given the same level of ability.

Women's Golf

As Exhibit 10 shows, the marginal cost (from Exhibit 2) of women's golf to WKU is $21,908; marginal revenues (from formula funding plus net registration) emanating from the players themselves is $4,977 at a minimum or $8,246 using the "" scenario. Under the latter we calculate a break-even point at 3.27 students; that is, the women's golf team would have to entice that number of (non-women's golf team) students to enroll at WKU in order to be self-financing.
EXHIBIT 9
Men and Women's Track and Field

A. Marginal Costs
   From Exhibit 2 $ 59,538

B. Marginal Revenue
   (i) From Exhibit 3 NA
   (ii) Revenue from Team Members
        Formula funding plus net registration\(\text{e}\)
        Minimum $ 66,036
        Typical $106,352

\(\text{e}\)Net of student athletic fees.
EXHIBIT 10
Women's Golf

A. Marginal Costs
From Exhibit 2 $ 21,908

B. Marginal Revenues
(i) From Exhibit 3 NA
(ii) From Team Members
Formula funding plus net registration\(^e\)

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 4,977</td>
<td>$ 8,246</td>
</tr>
</tbody>
</table>

\(^e\)Net of student athletic fees.
Alternatively, the women's golf team (which offers only 3 scholarships) could become more self-financing if offered more scholarships -- preferably to in-state students. (Note that this option should be exercised by all sports if they are currently offering fewer scholarships than the NCAA permits. Remember, the MC to WKU of a tuition scholarship is zero, and state support is a positive value.)

Men's Golf

Consider Exhibit 12, which presents the relevant information concerning men's golf. Marginal costs (from Exhibit 2) are $24,501; marginal revenues to WKU, generated by team members, is $16,076 at a minimum or $23,703 under the typical scenario.

Note that the men's golf team is, in effect, self-financing. It is more self-financing than the women's golf team because it offers more scholarships (7 versus 3), while it's overall costs are similar to the women's team.

Men's Tennis

Exhibit 13 shows that the men's tennis team is a net contributor to WKU's revenues. Its marginal costs are $14,682, and the team itself generates $13,558 in revenues at a minimum; under the typical scenario the members of the men's tennis team generate $21,186 in revenues in state funds and tuition.

Soccer

The soccer team, according to Exhibit 14, is a relatively large contributor to WKU's net revenues. Its marginal costs are only $10,468, while its marginal revenues are $28,322 at a minimum and are $40,308 under the typical scenario.
EXHIBIT 11
Women's Tennis

A. Marginal Costs
   From Exhibit 2
   $ 11,822

B. Marginal Revenue
   (i) From Exhibit 3
       NA
   (ii) From Team Members
        Formula funding plus net registration\textsuperscript{e}
        Minimum $13,594
        Typical $20,132

\textsuperscript{e}Net of student athletic fees.
EXHIBIT 12
Men's Golf

A. Marginal Costs

From Exhibit 2

$ 24,501

B. Marginal Revenues

(i) From Exhibit 3

NA

(ii) From Team Members

Formula funding plus net registration\textsuperscript{e}

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 16,076</td>
<td>$ 23,704</td>
</tr>
</tbody>
</table>

\textsuperscript{e}Net of student athletic fees.
EXHIBIT 13
Men's Tennis

A. Marginal Costs

From Exhibit 2  $ 14,682

B. Marginal Revenues

(i) From Exhibit 3  NA

(ii) Revenues from Team Members

Formula funding plus net registration\(^\text{e}\)

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 13,558</td>
<td>$ 21,186</td>
</tr>
</tbody>
</table>

\([^\text{e}]\text{Net of student athletic fees.}\)
EXHIBIT 14
Soccer

A. Marginal Costs
From Exhibit 2 $10,468

B. Marginal Revenues
(i) From Exhibit 3 NA
(ii) Revenue from Team Members

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula funding plus net registration&lt;sup&gt;e&lt;/sup&gt;</td>
<td>$28,322</td>
<td>$40,308</td>
</tr>
</tbody>
</table>

<sup>e</sup>Net of student athletic fees.
Swimming

The (men's) swimming team is also a net contributor to WKU's net revenues. Its marginal costs are $30,520 while its team members generate, at a minimum, $34,788; under the typical scenario this team generates $54,942.

Women's Volleyball

Women's volleyball generates a marginal cost of $55,231 to WKU. Its team members generate $29,187 in revenues, at a minimum, and $44,442 under the typical scenario; of course, these revenues are provided to WKU by the state in formula funding and by the students in net registration payments.

Under the typical scenario we estimate a break-even point at 2.5 students for the volleyball team; if that team can induce 2.5 (non-women's volleyball team) students to enroll at WKU, the program can be self-financing.

SECTION 4: ENROLLMENT EFFECTS OF FOOTBALL AND MEN'S BASKETBALL

Students who opt to attend WKU (and similar schools) view college partly as an investment, and partly as a consumption. We believe that they get more consumption enjoyment from schools that have athletic programs than they do from school's that don't. When choosing among schools that do offer athletic programs, such students prefer schools that have winning records to those that don't. As a consequence, we hypothesize that college athletics has an impact on a specific school's enrollment.

The Statistical Model

What impact do athletics have on enrollment? In the absence of a controlled environment in which to test this relationship, we must rely on statistical evidence. We examine the link between actual athletic success and actual enrollment changes, while controlling for systematic changes in enrollment that are unrelated to athletics. Given that WKU has not dropped
EXHIBIT 15
Swimming

A. Marginal Costs
From Exhibit 2

B. Marginal Revenues
   (i) From Exhibit 3
       NA
   (ii) From Team Members
        Formula funding plus net registration\textsuperscript{e}

Minimum
$34,788

Typical
$54,942

\textsuperscript{e}Net of student athletic fees.
**EXHIBIT 16**

*Women's Volleyball*

A. Marginal Costs

From Exhibit 2

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ 55,231</td>
</tr>
</tbody>
</table>

B. Marginal Revenues

(i) From Exhibit 3

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NA</td>
</tr>
</tbody>
</table>

(ii) From Team Members

Formula funding plus net registration*\textsuperscript{e}

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 29,187</td>
<td>$ 44,442</td>
</tr>
</tbody>
</table>

*Net of student athletic fees.*
athletics, we must be content with focusing on the link between performance and enrollment. (For those interested in more detail, we provide background citations to our statistical work, and we will provide our complete statistical results.)

We have chosen to use the ARIMA (Autoregressive Integrated Moving Average) statistical method to control for systematic movements in enrollment. This is a commonly employed technique for modeling time series data. The technique takes a time series of data, such as enrollment at WKU, and by differencing the series and/or by using lagged values and/or moving average terms, provides a statistical representation of movements in the series. Intuitively, the idea is to extract as much information as possible from the series itself about systematic movements in the series. The "best" representation is then chosen on the basis of explanatory power, uncorrelated residuals, and simplicity.

Data on enrollment of full-time students for the fall semesters, 1960-1988, were employed. Using the ARIMA technique, we found that a model that differenced enrollment once and included a first-order lag term best fit the series. (This uses the maximum likelihood estimation technique). That is, we used an ARIMA \((1,1,0)\) model as follows (where the b's represent coefficient values, t's represent years, and Enroll=enrollment):

\[ \text{Enroll}_t - \text{Enroll}_{t-1} = b_0 \text{Constant} + b_1 \text{Enroll}(t-1) - \text{Enroll}(t-2) + \text{Error}_t \]


ARIMA modeling is an alternative to setting up a "structural" statistical model which tries to identify all important determinants of a series. We choose the ARIMA technique because we are interested in simply accounting for systematic factors that may be driving enrollment over time and then looking at athletics—not in developing a complete model of all factors. In many situations, ARIMA models outperform structural statistical models. See Cooper (1972) and Naylor, et.al., (1972).

These data were obtained from the WKU Office of Institutional Research.
Next, to determine the impact of athletics, we included winning percentages for football and basketball for the two previous seasons, along with binary (values of 0 or 1) variables to indicate whether or not the teams had participated in post-season play in the prior two seasons. Overall, we found the following results:

1. Higher basketball winning percentages in the two previous years increased enrollment;
2. Basketball post-season participation did not have an additional influence;
3. Football winning percentages in the two previous seasons did not change enrollment;
4. Football post-season participation increased enrollment.

We report below the results of the statistical model with two-year lagged basketball winning percentages and football post-season play in either of the two previous seasons (t-statistics are in parentheses).15

\[
\text{Enroll}(t) - \text{Enroll}(t-1) = -837.0 + 0.67 \times \text{Enroll}(t-1) - \text{Enroll}(t-2) (4.20) \\
+ 1723.4 \times \text{B-ball WPCT} + 341.0 \times \text{F-Ball Post-season (2.79) (1.71)}
\]

The values for the estimated coefficients in the statistical model imply the following: A 0.500 winning percentage in basketball over the two prior seasons is associated with an 862 = (0.500 x 1723) increase in full-time student enrollment over a season with no wins; post-season football participation in either of the two prior seasons is associated with 341 = (1 x 341) more full-

14These data were obtained from the WKU Press Guides for those sports. Inclusion of separate variables in an ARIMA model forms what is called a transfer function.

15The model accounts for about 45 per cent of the variation in enrollment changes (i.e. first differences). As with any model, explanatory power is diminished when the data are differenced. Below we note the results when the data are not differenced.
time students than if no post-season play had occurred. The t-test result is that the football coefficient is significantly greater than 0 at the 5 per cent level and the basketball coefficient is significant at the 1 per cent level (using one-tailed tests).\textsuperscript{16}

We attempted to address some possible questions with further statistical work. First, we want to take account of other systematic factors that may be missed in the ARIMA model that increase enrollment across Kentucky--not just at WKU. To accomplish this, we included enrollment changes at all Kentucky colleges and universities except WKU in our statistical model. We found that enrollment changes in all other Kentucky colleges and universities provided no additional explanatory power for enrollment changes at WKU.\textsuperscript{17} However, the effects of football and basketball in the statistical model remained almost identical to those reported above. Second, we estimated the statistical model for the periods 1970-1988 and 1956-1988.\textsuperscript{18} This was intended to discount the huge successes of WKU athletics in the 1960s, which occurred while enrollment trended strongly upward. For these alternative periods, however, both football and basketball showed slightly larger effects on enrollment. Third, we desired to make clear the explanatory power of this statistical model. Therefore, we estimated the results with enrollment in levels rather than differences and by using the analogous regression model to our ARIMA model (a second lagged term on enrollment is added because the data are not

\textsuperscript{16}An application of the model to a case in which Division I-AA football was initiated yielded results consistent with those reported, above.

\textsuperscript{17}These additional enrollment data were found in Kentucky Full-Time Student Enrollments.

\textsuperscript{18}Over this period an ARIMA (0,1,1) model best fits the data.
differenced; the estimation method is OLS). The results appear below:

\[
\text{Enroll}_t = -132.0 + 1.08 \times \text{Enroll}_{t-1} - 0.33 \times \text{Enroll}_{t-2} + 1339.0 \times \text{B-Ball WPCT} \\
\quad + 386.0 \times \text{F-Ball post season} + 0.22 \times \text{ALL KY} \\
\quad (6.31) \quad (2.13) \quad (2.64) \quad (2.30) \quad (1.94)
\]

The estimated results are consistent with those found using the ARIMA technique. The one difference is that enrollment (in levels) at other Kentucky colleges and universities now has a positive and significant impact. The overall explanatory power of this model in levels is 98 percent of the variation in enrollment. As suggested previously, differencing the enrollment series diminishes the explained variation in the series. This is a characteristic of almost all time series. Also, by use of the F-test comparing residual sum of squares, we find that football and basketball add a statistically significant amount to the overall explanatory power of the regression.

As noted at the start of this section, these tests are not direct tests of the impact of dropping intercollegiate athletics, but they provide strong evidence of a link between athletics and enrollment. The most reasonable inference to draw from them is that the impact of actually eliminating intercollegiate athletics would be larger than the impact of a losing season.

In addition, as with any statistical results, a finding of correlation between variables does not necessarily imply causation. The correlation may be spurious or the direction of causation may run reverse to that indicated. We suggest some reasons why this result strongly implies a causal relationship: 1) a theoretical link between athletic success and enrollment clearly exists. Students attend college for investment purposes (acquiring knowledge and skills, ...) and consumption purposes (associations, parties,
intramurals, intercollegiate athletics,...). Athletic programs provide a source of advertising to attract students based on these consumption purposes. Successful athletic programs provide even more advertising; 2) no reason exists to expect causation to run in the opposite direction, that is, enrollment increases this year will not increase athletic successes in the previous two years; 3) the statistical results themselves provide evidence against spurious correlation. In our statistical tests we did not find a link between enrollment and winning in the same year (which obviously would be spurious), and the effect of winning on enrollment tailed off after a two year lag, again, as one would expect.

At this point, we compute the estimated increase in student enrollment for 1988-89 based upon the coefficients in the statistical model. Basketball had an average winning percentage of 0.649 for the two prior seasons. This translates into 1,118 extra students (0.649 x 1,723). The football team played in post-season play in 1987, so this translates into 341 extra students (341 x 1) in the model. The total increase implied by the statistical model is 1,459.

Enrollment and Revenues

We noted in Section 3 that in 1988-89 the entire athletic program at WKU experienced a net revenue drain (according to our model) of $330,036, and that it would have had to induced 79.5 students to enroll here.

Our statistical model, in fact, estimates that in the 1988-1989 school year the men's basketball team attracted 1,118 students and the football team attracted 341 students. Assuming that such athletically-enticed students are 86 per cent in-state and 14 per cent out-of-state (the same proportion as the rest of the student body), and assuming that they take the typical courses, we estimate a third source of revenues at $6,089,866. In short, given its
current situation if WKU had had no athletic program in 1988-89, its total costs would have fallen by about $2,191,477, and its total revenues would have fallen by $7,951,307. Stated differently, WKU's net revenues would have fallen by $5,759,831 = $7,951,307 - $2,191,477. It should be stressed that this (and the estimates from the individual sports) effect is only a short-run effect. Chances are quite good that the longer-run financial effects would be even more dire.

In Section 3 we also indicated that (according to our model) the football team, in the 1988-89 school year, was a net drain of $245,209 on the University's resources, and that that sport needed to attract about 59 students to break even.

However, we estimate that in 1988-89 the football team enticed approximately 341 students, which (assuming a typical course of study and assuming that they are in the same in-state/out-of-state proportion) has a revenue effect of $1,423,334.

In other words, had there been no football team during the 1988-1989 school year, total costs would have fallen by $766,746 and total revenues would have fallen by $1,944,871. In that sense the football program that year was a net revenue contributor of $1,178,125.

Our economic model indicated, in Section 3, that men's basketball contributed net revenue, to WKU's financial resources, of $281,010 even without considering its effects on enrollment. Our statistical model, however, estimates that the basketball team enticed about 1,118 students to WKU in the 1988-89 school year. Thus enrollment revenues emanating from the men's basketball team are $4,666,532; the entire net revenue effect contributed by men's basketball is $4,947,542. Stated differently, had there been no basketball team in 1988-89 WKU's net revenue loss would have been $4,947,542.
CONCLUSIONS

Overall, the athletic program is a tremendous contributor to WKU's finances; it added over $5 million to net revenues in the 1988-1989 school year. These funds contribute to faculty salaries and to the financing of the school's educational mission. The source of these funds is largely state formula funding and student tuition from (a) the athletes themselves and (b) students attracted to WKU because of its athletic program. Moreover, our analysis concentrates on the short-run effects of the athletic program; the long-run effects of the elimination of the entire athletic program would prove to be financially devastating.

The football team was an apparent net drain on WKU's finances in the 1988-1989 school year; had there been no football team, total costs would have fallen by about $245,000 more than total revenues would have fallen. If that sport could have induced the enrollment of about 59 students, its revenue drain would have been plugged. In fact, our statistical analysis implies that in the 1988-1989 school year the football team increased enrollment by approximately 341 students. As a result the football program contributed net revenues of about $1,178,125 to WKU in that year. This conclusion is at wide variance with the general perception.

The men's basketball program is a huge financial success. In 1988-1989 it was a net revenue contributor of about $4.9 million, including its enrollment-enhancing effect.

In 1988-89 the women's basketball team's marginal costs exceeded its marginal revenues by about $273,000. That revenue drain could have been covered if the women's basketball team had attracted about 65 students to WKU. We have made no statistical estimate, but, considering the performance of the Lady Toppers, it would not be surprising if at least that number have been attracted here because of them.
Due largely to the fact that the athletes themselves generate revenues to WKU in the form of direct tuition payments (full or partial) and state formula funding, even the "non-revenue" sports are not as much a drain on revenues as one might think. Indeed, such sports as track and field, men's and women's tennis, soccer, and swimming actually contribute to net revenues; the men's, golf team is close to breaking even.

One interesting conclusion is that the minor sports teams could become more self-financing (or can become larger contributors to net revenues) if they were to give as many scholarships as the NCAA permits, preferably to in-state students of equal ability.

This last point leads us to an important conclusion. Some people concerned with costly athletic programs at WKU (and elsewhere) have suggested that we drop to lower competitive levels (i.e. to division II or division III). However, because such a class reduction (for WKU at least, and in the short run) merely entails giving fewer scholarships, such a move would reduce WKU's revenues by more than its costs would fall. In short, such a step would be more costly, in purely financial terms.

Finally, we stress that our study has been confined merely to a financial analysis of WKU's athletic program. We have avoided the normative issues concerning college athletics and college athletes; with respect to those other issues our opinion is no better (or worse) than anyone else's. Still, as economists we would be remiss if we did not note that because college athletics is voluntary, college athletes (and their families) perceive a gain. As a consequence it is not only athletic administrators, alumni, faculty, and townpeople who benefit from college athletics.
References


