COMPETITIVE ADVANTAGE IN INTERCOLLEGIATE ATHLETICS

: A RESOURCE-BASED VIEW

DISsertATION

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By

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ABSTRACT

The success of intercollegiate athletics brings significant social, economic, and political benefits to institutions of higher education. Therefore, universities have been attempting to enhance their competitive capability in athletics. Despite these efforts some athletic departments do not gain such competitive advantages. Based on the Resource Based View (RBV) of competitive advantage of organizations, this research explored the dynamics of resources contributing to competitive advantages in intercollegiate athletics. The proposed model posited that the intangible resources of a university (i.e., athletic reputation, and academic resource) would influence the generation of more tangible resources (i.e., human resource, and financial resources) which in turn would influence the attainment of athletic performance goal (i.e., Sears’ Cup score) and athlete development goals (i.e., graduation rates and gender equity).

The model was tested with archival data of 324 NCAA Division I member institutions in two stages where the measurement model was tested followed by the structural model. Confirmatory factor analysis showed that the measurement model fit the data well ($\chi^2$/df=2.91, RMSEA=.077, GFI=.983, NFI=.984, CFI=.990). The structural model also fit the data well ($\chi^2$/df=3.20, RMSEA=.08, GFI=.947, NFI=.952, CFI=.966). The hypothesis that intangible resources contribute to the generation of tangible resources
was supported ($R = .91, p < .01$). In addition, the athletic department’s resources were
strongly related to the attainment of both the performance and developmental goals.
However, the resources contributed more to the attainment of performance goals ($R = .91,$
$p < .01$) than to the attainment of developmental goals ($R = .24, p < .01$). In discussing
these results, recommendations for future research were also offered.
Dedicated to my late mother

Young-Ok Park (1946–1997)
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I wish to thank my advisor, Dr. Packianathan Chelladurai (Chella), for his endless moral and intellectual support throughout my doctoral studies and for giving me a new professional identity. His intellectual enthusiasm to contribute to the academic field of sport management will continue to be inspiring my research. Most of all, I thank Chella and Ponnu for being terrific friends of mine.

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vi</td>
</tr>
<tr>
<td>List of Tables</td>
<td>ix</td>
</tr>
<tr>
<td>List of Figures</td>
<td>x</td>
</tr>
</tbody>
</table>

## Chapters:

1. **Introduction** ........................................................................................................... 1

   - Resource-Based View (RBV) .................................................................................... 4
   - Classification of Resources ................................................................................. 7
   - Tangible and Intangible Resources ....................................................................... 9
   - Resources in Intercollegiate Athletics ............................................................. 13
     - Organizational Resources (Intangible Resources) ............................................. 13
     - Financial/Physical Resources ......................................................................... 16
     - Human Resources ............................................................................................. 17
   - Resources and Organizational Types .................................................................... 17
   - Goals of Intercollegiate Athletics ..................................................................... 20
   - Model of Resources and Outcomes in Intercollegiate Athletics ...................... 21
   - Alternative Model .............................................................................................. 23
   - Purpose ........................................................................................................... 25
   - Definitions of Terms ......................................................................................... 25
   - Limitations ........................................................................................................ 27
   - Delimitation ....................................................................................................... 27

2. **Review of The Literature** ....................................................................................... 28

   - Strategic Management .......................................................................................... 28
   - Resource-Based View (RBV) ................................................................................ 31
     - Resources ......................................................................................................... 33
     - Resource Attributes ......................................................................................... 34
     - Rents ................................................................................................................. 37
     - Resource Categorization .................................................................................... 41
     - Tangible and Intangible Resources ................................................................... 44
   - The RBV in Intercollegiate Athletics .................................................................. 48
   - Resources and Organizational Types .................................................................... 50
Intercollegiate Athletic Goals ................................................................. 52

3. Methodology.......................................................................................... 60
    Research Design ................................................................................... 60
    Types of Research .............................................................................. 60
    Quantitative Research ...................................................................... 61
    Available Date (Archival Data) ......................................................... 64
    Population and Sample ...................................................................... 68
        Sample Size .................................................................................. 69
    Model Simplification ......................................................................... 72
    Study Variables .................................................................................. 75
        Independent Variables .................................................................. 75
        Dependent Variables .................................................................... 75
    Data Collection Procedures ............................................................... 76
    Data Analysis ..................................................................................... 76

4. Results..................................................................................................... 82
    Descriptive Analysis ........................................................................... 82
        Sample Characteristics .................................................................. 82
        Normality ...................................................................................... 87
        Multicollinearity .......................................................................... 89
        Reliability ..................................................................................... 89
    Measurement Model .......................................................................... 92
    Structural Model Testing ................................................................. 98
    Path Analysis ...................................................................................... 104
        Direct Effects ............................................................................... 105
        Indirect Effects ............................................................................ 105
    Model Comparison ............................................................................. 106

5. Discussion .............................................................................................. 108
    Summary of the Current Study ........................................................... 108
    Resource Categorization .................................................................... 110
    Intangible Resources in Intercollegiate Athletics ................................ 111
    Managerial Implications ................................................................... 115
    Limitations and Recommendations .................................................. 119

List of References ..................................................................................... 124
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>10</td>
</tr>
<tr>
<td>1.2</td>
<td>22</td>
</tr>
<tr>
<td>4.1</td>
<td>83</td>
</tr>
<tr>
<td>4.2</td>
<td>86</td>
</tr>
<tr>
<td>4.3</td>
<td>88</td>
</tr>
<tr>
<td>4.4</td>
<td>90</td>
</tr>
<tr>
<td>4.5</td>
<td>91</td>
</tr>
<tr>
<td>4.6</td>
<td>95</td>
</tr>
<tr>
<td>4.7</td>
<td>96</td>
</tr>
<tr>
<td>4.8</td>
<td>97</td>
</tr>
<tr>
<td>4.9</td>
<td>99</td>
</tr>
<tr>
<td>4.10</td>
<td>101</td>
</tr>
<tr>
<td>4.11</td>
<td>101</td>
</tr>
<tr>
<td>4.12</td>
<td>102</td>
</tr>
<tr>
<td>4.13</td>
<td>104</td>
</tr>
<tr>
<td>4.14</td>
<td>105</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>A Proposed Model of Resources in IA</td>
<td>12</td>
</tr>
<tr>
<td>1.2</td>
<td>Alternative Model of Resources in IA</td>
<td>24</td>
</tr>
<tr>
<td>2.1</td>
<td>Resource Attributes and Rents</td>
<td>40</td>
</tr>
<tr>
<td>4.1</td>
<td>Confirmatory Factor Analysis Representation of the Measurement Model</td>
<td>94</td>
</tr>
<tr>
<td>4.2</td>
<td>Resources Model for Intercollegiate Athletics</td>
<td>98</td>
</tr>
<tr>
<td>4.3</td>
<td>Alternative Structural Model</td>
<td>107</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

The importance and impact of intercollegiate athletics (hereafter, IA) in America are enormous in every aspect of American society. To begin with, let us look at the number of people involved in it. In terms of student-athletes, 367,653 student-athletes participated at the National College Athletic Association (NCAA) level in 2002 (NCAA Participation, 2003). In 1995-96, nearly 250,000 first-time college freshmen continued their participation in sport by competing at the NCAA, National Association of Intercollegiate Athletics (NAIA) or the National Junior College Athletic Association (NJCAA) level (NCAA Participation, 1997). As for fans, 44,556,215 people attended NCAA football games in 2002 and 30,124,304 sport fans attended NCAA basketball games (NCAA, 2003).

The significance of IA, especially Division I level, is further highlighted by its economic impact. For example, the annual budget of a typical Division I athletic department may be bigger than the budget allotted to sports in many other nations. The total national revenue and expenditure of Liberia in Africa in 2000 were $85.4 million and $90.0 million, respectively. Similarly in 2000, the national budget and expense of one of Caribbean countries, Aguilla, were $22.8 and $22.5 millions, respectively (Central
Intelligent Agency, 2004). In contrast, in 2002-03 season, the average annual revenues and expenses of NCAA Division I-A members were $25,100,000 and $23,200,000, respectively. In addition, the largest reported revenue and expense by a single institution were $79,600,000 and $52,100,000 in 2001 (NCAA, 2003). The revenues and expenses of athletic departments are just one aspect of the economic impact of intercollegiate athletics. If we consider other economic and financial aspects of intercollegiate athletics such as sponsorships, marketing effects, community economics, and broadcasting, the impact of an athletic department could be even greater.

However, the economic impact of intercollegiate athletics is just a small fraction of its total influence on the universities. The social impact of intercollegiate athletics is seen in the cultivation and maintenance of university tradition and community relations (Duderstadt, 2000; Raitz, 1995), increases in college applications (Toma & Cross, 1998), and even political influence (e.g., Padilla & Baumer, 1994). Intercollegiate athletics are often considered as a way to project the image of the university to the public. Due to this visibility, athletic programs often play an important role in public relations and promotion of the university community as a whole. Further, intercollegiate athletics, particularly the big-time revenue programs such as basketball and football, have become part of college life of university students. Therefore, they foster positive relations between the university and its students and alumni. In sum, successful intercollegiate athletics can contribute for better student recruitment, alumni relations, and school life, and increase alumni donations and endorsements (Grimes & Chressanthis, 1993; Toma & Cross, 1998).
The public image and the prestige of universities are altered daily by the successes and failures of their athletic programs. Media exposure of athletic teams has not only generated revenue for institutions but also has made institutions more attractive to potential students (Underwood, 1980). Thus, athletic success has implications for academic success of each institution (e.g., larger pool of prospective students, bigger endowments for academic purposes); that is, the success of intercollegiate athletics is of critical importance for various universities.

Successes and Failures in Intercollegiate Athletics

The foregoing analysis of the importance of intercollegiate athletics is reflected in the increasing efforts to develop the athletic departments with a view to creating winning teams in different sports. Despite these efforts, only a few of the 324 Division I institutions in the NCAA and 115 Division I-A member institutions are thriving while others are financially struggling (NCAA Report, 2003). For example, most of NCAA Division I-A, I-AA, and I-AAA institutions were in financial deficit of $600,000, $3,400,000, and $2,800,000 respectively. Without institutional support, only 35% of Division I-A, 8% of Division I-AA, and 7% of Division I-AAA members created surpluses in the same market (NCAA, 2003). Aside from financial successes, there are other performance differences among the universities. In terms of the Sears Directors’ Cup rankings (NACDA, 2003), several Division I members such as Stanford, UCLA, and Michigan have produced winning programs over competing institutions. Especially, Stanford has been the winner for several years. In terms of winning percentages for school-to-school contests, some big-time institutions such as Nebraska (73.7%), Stanford (72.2%), Southern California (71.3%), and Arizona (69.8%) consistently produced
winning programs while other big-name institutions such as Northwestern (32.3%), Kentucky (44.0%), and Pittsburg (45.4%) reported lower winning percentages. In terms of student-athletes’ graduation rate, such NCAA members as Syracuse (81%), Stanford (86%), and Virginia (84%) have been successful while other member institutions such as Oklahoma State (24%), Florida (41%), and Louisville (35%) show poor graduation rates of student-athletes (U.S. News, 2002).

Given the differences in the effectiveness among institutions of similar sizes and types, the question then is why some athletic departments are successful in achieving some of their goals while others fail to do so. In other words, why are some departments achieving competitive advantages over others in different spheres of endeavor? I submit that explanations for the successes of some departments and failures of others can be gleaned from the recently advanced strategic approach of resource-based view (hereafter, RBV) of organizations.

Resource Based View (RBV)

In the resource based view, an organization is seen as a bundle of productive resources (Penrose, 1958). Thus, this theory suggests that the sustainable competitive advantage of the firm comes from how organizations can obtain critical resources, and utilize those resources productively (Barney, 1991; Teece, Pisano, & Shuen, 1997). Wernerfelt (1984) defined a resource as “anything which could be thought of as a strength or weakness of a given firm” (p. 172) and Barney (1991) defined firm resources as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness” (p. 101). While scholars differ in
how they define the concept of resources, there is the underlying theme that resources are “the basis for the implementation of firm strategy” (Hitt, Ireland, & Hoskisson, 2001) and “sources of competitive advantages” (Barney, 1991).

The RBV theory starts with the assumptions that (a) organizations in a given industry may have heterogeneous resources and (b) the resources are imperfectly mobile (Barney, 1991). The two characteristics of resource heterogeneity and imperfect mobility make some of those resources valuable, rare, imperfectly imitable, and hardly substitutable (Barney, 1991). The most basic attribute of resources may be the extent to which they have certain value to performances of the organization because “firm resources can only be a source of competitive advantage or sustained competitive advantage when they are valuable” (Barney, 1991, p. 106). Values or returns of resources would be greatly realized if such valuable resources are possessed by smaller number of competitors (Barney, 1991). Thus, organizations may not gain competitive advantage from valuable resources if such resources are readily available for competing organizations (Miler & Shamsie, 1996).

As opposed to a temporal competitive advantage gained from value and rareness of resources, a sustainable competitive advantage may come by as long as resources have such attributes as imperfectly imitability (Lippman & Rumelt, 1982) and substitutability (Barney, 1991). Imperfectly imitability indicates that “firms that do not possess these [valuable and rare] resources cannot obtain them” (Barney, 1991, p. 107). Substitutability concerns whether there is an alternative resource that can facilitate strategically equivalent performance (Andreu & Ciborra, 1996; Barney, 1991). In sum, the potential of a resource to contribute to competitive success is a function of the extent
to which that resource is valuable, rare, inimitable, and not substitutable (Barney, 1991). In addition to those four attributes of resources, Barney (1995) introduced “organizational orientation” as an organizational attribute in a sense that the maximized competitive advantage can be realized only when an organization is successful in how to utilize its resources (Barney, 1995) as well as organizations may overcome the issue of unsubstitutability by means of management (e.g., implementing different strategies, or duplicating same strategies with different resources).

In the context of intercollegiate athletics, Smart and Wolfe (2000) used Barney’s (1991) resource categorizations in their study of sustainable competitive advantage in intercollegiate athletics. With the resource-based view as a tool kit, their study exploratively investigated the plausible sources of the success in terms of types of resources in intercollegiate athletic programs (i.e., Big Ten football programs) where the intercollegiate athletic program success was defined as a package of successes in winning (e.g., win-loss records), educational (e.g., student-athlete graduation rate), ethical (e.g., absence of NCAA rule violations), and financial (e.g., financial surplus) aspects of each program (Putler & Wolfe, 1999; 2000). Based on this framework, Putler and Wolfe argued that the Penn State football program appeared to be the most successful team among Big Ten football programs and, thus, seemed to have sustainable competitive advantages over competitors in the field. Further, they argued that organizational resources such as the Penn State football team’s history and culture (operationalized as the coaching staff’s long tenure) are the source of sustainable competitive advantage among three broad types of resources (i.e., physical, human, and organizational resources). In their view, physical resources (e.g., stadium, training facilities and
equipment, dormitories, information management systems for recruiting and game analysis) and human resources (e.g., athletic ability of student-athletes, coaches’ experience) are valuable yet not rare in comparison to competitors. Cunningham (2003) investigated the impact of human resources on the performance of Division I athletic departments. He used the average of the coaches’ salaries and the recruiting budget as operational measures of human resources and the Sears Directors’ Cup scores as a measure of performance. In another study, Cunningham and Sagas (in press) found that human resources (operationalized as coaching experience and racial diversity of coaching staff) was a significant predictor of football program success. While these studies represent pioneering efforts in employing the resource-based view in investigating competitive advantage in intercollegiate athletics, they are rather narrow in their scope. In the first case, Smart and Wolfe (2000) analyzed the resources of a single athletic program while Cunningham (2003) and Cunningham and Sagas (in press) investigated the influence of a single resource (i.e., human resources) on the performance of several university programs. The proposed study is far more comprehensive as it investigated the influence of several types of resources in competitive advantage of several universities and across different outcomes.

Classification of Resources

An understanding of the phenomenon is facilitated by classifying the resources and developing a profile of an organization’s resources based on that classification (Grant, 1991; Mahoney & Pandian, 1992). Thus, resource categorization may help managers to map their strategic position in a given industry (Teece et al., 1997).
Barney (1991) categorized firm resources into *physical capital* resources (e.g., physical technology, plant and equipment, geographic location), *human capital* resources (e.g., experience and knowledge of individuals associated with a firm such as sales personnel), and *organizational capital* resources (e.g., history, relationships, trust, and organizational culture). Later, Barney (1995) added one more resource category, *financial capital* resource (e.g., debt, equity, and retained earnings). In addition to this well-known categorization, scholars have suggested different or extended categorizations.

For example, Hofer and Schendel (1978, p. 144-153) suggested that a resource profile combines the following resources and capabilities: (a) Financial resources (e.g., cash flow, debt capacity, new equity availability); (b) Physical resources (e.g., plant & equipment, inventories); (c) Human resources (e.g., scientists, production supervisors, sales personnel); (d) Organizational resources (e.g., quality control systems, corporate culture, relationships) and; (e) Technological capabilities (e.g., high quality production, low cost plants). Grant (1991) added one more category labeled *reputation* to the above five categories where reputation stands for “the knowledge and emotions held by individuals about a product range” (Hall, 1992, p. 138). Based on the works of Barney (1991) and Mahoney and Pandian (1992), Shapiro (1999) suggested that resources can be grouped into physical, human, financial, organizational, information technology, marketing resources, and legal resources (e.g., patents and contracts). The contribution of Shapiro is in adding the categories of marketing and legal resources that have been ignored by previous scholars. Mosakowski (1999) and Alvarez and Busenitz (2001) suggested that a new category of *entrepreneurial* resources should also be added to the list. According to Godfrey and Gregersen (1999), entrepreneurial ability refers to “the
capacity to identify, develop, and complete new combinations of existing asset bundles or new asset configurations” (p. 41). The above categories of resources are presented in Table 1.1.

Tangible and Intangible Resources

The foregoing list of categories of resources is comprehensive, they include what scholars have labeled the tangible and intangible resources (Carmeli, 2004; Hall, 1992, 1993). “Tangible resources consist of all physical items that the organization possesses, such as facilities, raw materials and other equipment. Intangible resources comprise all items not appearing in the material reports (balance sheets) such as organizational culture, reputation, and internal control” (Carmeli, 2004, p. 111). In Carmeli’s (2004) view, tangible resources are flexible, easily acquired and/or imitated while intangible resources, by definition, are inflexible. Hence, “intangible, more than tangible, resources have potential for competitive advantage creation” (p. 112). To illustrate, intercollegiate athletic departments register their logos which are then licensed to other commercial firms. Hall (1992) would view the registered right to the logo itself as an intangible asset. To the extent the demand for the use of the logo and the sale of licensed goods are based on the reputation of the university, the reputation becomes even more of an intangible asset. Thus, a university’s reputation can not be duplicated by another while the process of creating a logo and licensing it to generate revenue can be easily copied. In the context of intercollegiate athletics, we can conceive of the intangible resources as contributing resources in the sense they facilitate the garnering of the more tangible resources.
<table>
<thead>
<tr>
<th>Categories</th>
<th>Author(s)</th>
<th>Definition/ Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human</td>
<td>Barney (1991), Grant (1991), Hofer &amp; Schendel (1978), Shapiro (1999)</td>
<td>Human resources include all the experience, knowledge, judgment, risk taking propensity, and wisdom of individuals associated with a firm (Barney, 1995)</td>
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<tr>
<td></td>
<td>Teece et al. (1997)</td>
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<tr>
<td>Organizational</td>
<td>Barney (1991), Grant (1991), Hofer &amp; Schendel (1978), Shapiro (1999)</td>
<td>The history, relationships, trust, and organizational culture that are attributes of groups of individuals associated with a firm, along with a firm’s formal reporting structure, explicit management control systems, and compensation policies (Barney, 1995).</td>
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<tr>
<td>Technological</td>
<td>Grant (1991), Hofer &amp; Schendel (1978), Shapiro (1999)</td>
<td>Technological resources include inventory management system, communication networks, and high-quality products (Hofer &amp; Schendel, 1978; Shapiro, 1999).</td>
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<td>Marketing</td>
<td>Mahoney &amp; Pandian (1992), Shapiro (1999), Srinivasta et al. (2001)</td>
<td>Marketing assets may include brand name and reputation (Aaker, 1991), customer loyalty (Payne et al., 1995), country of origin (Hooley et al., 1988) and current market position (Treacy &amp; Wiersema, 1995).</td>
</tr>
<tr>
<td>Legal</td>
<td>Hooley et al. (1998), Shapiro (1999)</td>
<td>Legal assets include patents, copyrights, and contracts (Shapiro, 1999).</td>
</tr>
<tr>
<td>Entrepreneurial</td>
<td>Alvarez and Busenitz (2001), Mosakowski (1999), Godfrey and Gregersen</td>
<td>The capacity to identify, develop, and complete new combinations of existing asset bundles or new asset configurations (Godfrey &amp; Gregersen, 1999).</td>
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</tr>
</tbody>
</table>

Table 1.1. Categorizations of Resources
For instance, the good will toward the university (an intangible and contributing resource) would be reflected in the endowments (tangible resource) bestowed by well wishers. It must be noted that intangible resources can take on various forms (Schoenecker & Cooper, 1998). In the context of intercollegiate athletics, the intangible resources can be represented by several types of organizational capital (e.g., athletic reputation, academic reputation, tradition, etc.). For the purposes of this study, intangible resources and organizational capital were conceptualized as one and the same. Further, it is argued that the organizational resources (i.e., intangible resources) are the contributing factors for the generation and/or accumulation of financial and human capital.

One significant issue is to identify generalizable types of resources that possess the potential to create sustainable competitive advantage in a given context (Chatterjee & Wernerfelt, 1991; Ray et al., 2004). In our context, some types of resources touted in the literature may not be critical or applicable to intercollegiate athletics. For instance, technological resources may be the most critical for Information Technology industry (Shapiro, 1999) while being less critical for the sport industry where intensive human capital resources are more critical (Chelladurai, 1999; Cunningham & Sagas, in press).

I have followed Barney’s (1991) original categorizations in specifying the following resources for investigative purposes. They were grouped into (a) organizational, (b) physical, and (c) human resources (see Figure 1.1). The current study used physical and financial resources interchangeably in that organizations can build or buy their physical resources (Putler & Wolfe, 2000).
Figure 1.1: A Proposed Model of IA Resources
Resources in Intercollegiate Athletics

Organizational Resources (Intangible Resources)

Athletic reputation. Reputation is defined as “the evaluation of a firm by its stakeholders in terms of their affect, esteem, and knowledge” (Deephouse, 2000). This reputation in the context of universities may relate to their athletic as well as their academic endeavors. Athletic tradition is built on the excellence exhibited by the athletic teams over a number of years. And athletic excellence is reflected in the number of championships won over the years. Championships allow an athletic department to promote itself and the university to critical stakeholders and thus cultivate the reputation. Therefore, the cumulative number of NCAA championships of each athletic department would be a good indicator of athletic reputation. It is noted that because the unit of analysis of the current study is each athletic department rather than a specific athletic team, the cumulative championships of all sports is the measure of interest. This information was available from the official website of the NCAA.

Academic reputation. This variable concerns academic excellence of institutions in which athletic departments are housed. Academic reputation and standing has been the basis for classification of universities (e.g., Carnegie Mellon classification). There are several indices available regarding academic reputation such as undergraduate rankings in U.S. News, and Carnegie Mellon categorization. However, U.S. News uses different ranking systems for doctorate institutions and non-doctorate institutions. Thus, the ranking does not provide any comparative information between universities with doctoral programs (e.g., University of Kentucky) and those with masters’ program only (e.g., Murray State University). Similarly, Carnegie Mellon categorization only deals with
research universities which have doctoral programs. Thus, the present study used the freshmen entrance difficulties provided by the Peterson’s College Guide as proxies for academic reputation because the Peterson’s Guide provides entrance difficulty data for all institutions associated with NCAA Division I.

**Tradition.** According to strategic management literature, tradition/history might be associated with first-mover advantages (Arthur, 1989). In addition, it has been suggested that the position and behavior of the organization is often decided by the past experience of the organization (Barney, 1991; Teece et al., 1997). Likewise, an organization’s accumulation of resources and capabilities can be path-dependent (Dierickx & Cool, 1989). Path-dependence makes resources inimitable and nontradable in that each organization has differently interacted with the environments and developed unique organizational routines (Barney, 1991; Nelson, & Winter, 1982) as well as unique organizational culture (Barney, 1986). Given that history matters for the logic of path dependency (Teece et al., 1997), the history of the institution (operationalized by years since establishment) can be a good measure to assess one of organizational resources. Therefore, years since establishment of the university would be a good proxy for the tradition and culture of each university. This information concerning years since establishment was available at Peterson’s College Guide.

**University Size.** In a constitutive term, university (organizational) size refers to the dimensions or largeness of a university. Large organizations are said to garner more resources than smaller ones (e.g., capital investments, land area, etc.). While the classification of universities as NCCA Division I, II, or III parallels the differences in size of the university, there are considerable differences among the schools in each division.
It was proposed to use student enrollment as a surrogate measure of university size. While students in a university may be considered as human capital, we need to note that athletes and coaches in an athletic department are the real human resources for the department while the enrollment in the larger university is an organizational resource (Cunningham, 2003). This data was available from the Peterson’s College Guide.

*Faculty size.* The number of faculty in a university is a resource critical to the academic development of its students. While the number of students and number of faculty are likely to be highly correlated, there are universities which are focused on keeping the faculty-student ratio as low as possible. Hence, it was proposed to use faculty size as a significant organizational resource. As the student-faculty ratio may be a better indicator to explain academic aspects of institutions, it was proposed to compute this ratio for use as a measure of organizational resource. It was recognized that several other factors such as academic reputation, academic support systems, and degree programs may be correlated with faculty size. Data concerning faculty size were available from Peterson’s College Guide.

*Endowments.* Although endowments are largely financial in nature they do reflect the goodwill created by the university, and the loyalty and commitment of stakeholders (particularly, the alumni) to the university. Thus, the amount of endowments may be the most critical indicator of the positive relationship between the university and its stakeholders. This information was also available from Peterson’s College Guide.

*Population of city.* The size of the city in which a university is located may have a bearing in our context. First, as the size of the population increases, the number of fans of athletic teams of the focal university and the spectators at this university event would
increase. From a different perspective, the higher the population of the city the higher the possibility of other athletic events and other entertainment events held by agencies other than the focal university. Thus the entertainment dollar that would normally accrue to the focal university could be siphoned off by other entities. On the academic side, it could be argued that the smaller the city the lesser the distractions from academic pursuits. This information was available from the Sperlings’ Best Place.

*School type (public or private).* The term refers to whether each institution is supported by or affiliated with private or public foundations. Based on higher education literature, there are differences between private and public universities in terms of funding, legal requirements, and stakeholder relationships (Stadtman, 1992). This information was available from Peterson’s College Guide.

*Financial/Physical Resources*

Financial and physical resources are fundamental to any organization in any context. In the context of intercollegiate athletics, these resources are required to run the athletic program in general, operate individual athletic teams, organize athletic events, recruit athletes, and offer scholarships to them. It was proposed to use the following as the indicators of financial resources.

*Sports Expenses.* According to the U.S. Department of Education, operating expenses are defined as all expenses an institution incurs attributable to home, away, and neutral-site intercollegiate athletic contests (commonly known as “game-day expenses”), for (a) lodging, meals, transportation, uniforms, and equipment for coaches, team members, support staff (including, but not limited to team managers and trainers), and others; and (b) officials. The data was available from the U.S. Department of Education.
Administrative Expenses. The expenses not allocated by sport refer to expenses attributable to such intercollegiate athletics as appearance guarantees and options, contract services, fundraising activities, and promotional activities. The data was also available from the U.S. Department of Education.

Number of programs. The term refers to the total number of sports supported by each athletic department. This variable can be a proxy for financial resources of athletic departments (Cunningham, 2003) as well as physical resources. The fact that an athletic department can provide a large number of athletic programs may mean that the athletic department provides an adequate amount of physical resources (e.g., facilities, equipments) to all athletic programs. This data was available at “Equity in Athletics” from the U.S. Department of Education.

Human Resources

Number of coaches. The term is defined as the total numbers of coaching staffs associated with each athletic department. While the greater numbers of employees do not always indicate a better quality of human resources at an organization, universities tend to hire coaches with expertise, experience and diverse perspectives on coaching. This data was available at “Equity in Athletics” from the U.S. Department of Education website.

Number of athletes. The term is defined as the total number of student-athletes in each athletic department. Although the rules of a particular sport specify the number of athletes on the roaster for an event, universities are at liberty to carry more or less number of athletes. The larger the number of athletes, the greater the possibility of the emergence of higher performers. This is particularly true in collegiate ranks as the athletes are still
in growth and development stage. It is not uncommon to see substitutes and bench warmers from one year becoming superstars in the next year. This data was also available at “Equity in Athletes” from the U.S. Department of Education.

_Coaches’ salary._ According to the U.S. Department of Education, institutional (coaches’) salary refers to all wages and bonuses an institution pays a coach as compensation attributable to coaching. Thus, the salary in this includes bonuses that a person makes for coaching a varsity team. This figure is a proxy for the quality and expertise of individuals associated with an athletic department. Given that compensation systems are mostly based on individual ability and expertise (e.g., coaching experience and ability to manage a program), the coaches’ salary may be a salient measure of human resources (Cunningham, 2003). As the unit of analysis is the athletic department itself, the average salaries paid to all coaches in an athletic department (i.e., head coaches and assistant coaches in all sports) would be the measure employed in this study. This data was available at “Equity in Athletics” from US Department of Education.

_Athletic-related student aid._ According to the term defined by U.S. Department of Education, athletic-related student aid refers to any scholarship, grant, or other form of financial assistance, offered by an institution, the terms of which require the recipient to participate in a program of intercollegiate athletics at the institution. Other student aid, of which a student-athlete simply happens to be the recipient, is not athletically related student aid. Compensation is one of the critical factors influencing job-choice decision and this fact is also applicable to student-athletes, especially student-athletes at Division II or III levels. Given the situation that monetary compensation (e.g., salary) is not allowed other than athletic scholarships or athletic-related student aids, athletic
A related but significant issue is the determination of the relative significance of the varied resources. Stated otherwise, managers must determine which of the resources are critical to the organization. Theories suggest that the relevance or criticalness of a given resource varies across organizational and industrial types. For instance, the critical resources of a manufacturing firm (e.g., a manufacturer of furniture) would be different from those of a service firm (e.g., a restaurant). In our context, some of the critical resources required by an intercollegiate athletic department would differ from those required by, for example, a city recreation department. This distinction is based on the products of the organizations. We can extend the argument to the distinction between business organizations and nonprofit organizations based on the criterion of making profit. Thus, a professional sport franchise would require certain critical resources that may be different from those required by an intercollegiate athletic department. An extension of this perspective would suggest that even within a single organization (or a group of organizations), different resources would become critical to achieve different goals it (or they) may pursue. In our context, to the extent intercollegiate athletic departments pursue both academic and athletic goals, different types of resources would
be critical to achieving the differing goals. The goals of intercollegiate athletics are explicated below.

Goals of Intercollegiate Athletics

An attribute of organizations, in general, is that they pursue multiple goals. The existence of multiple goals and their impact are much pronounced in the case of intercollegiate athletics. The identification and description of athletic goals has been the focus of the seminal works of Chelladurai and his associates (Chelladurai, 2001; Chelladurai & Danylchuk, 1984; Chelladurai, Inglis, & Danylchuk, 1984; Trail & Chelladurai, 2000). Trail and Chelladurai (2000) identified the following 10 goals of intercollegiate athletics:

(1) Student-athlete academic achievement;
(2) Student-athlete health/fitness;
(3) Student-athlete social/moral citizenship;
(4) Organizational culture of diversity;
(5) Student-athlete careers;
(6) University visibility and prestige;
(7) Financial security;
(8) Winning;
(9) Entertainment; and
(10) National sport development.
As shown in Table 1.2, Trail and Chelladurai (2000) grouped these ten goals into (a) performance goals (i.e., winning, entertainment, visibility and prestige, financial security, and national sport development) and (b) developmental goals (i.e., academic achievement, health/fitness, social/moral citizenship, careers, and culture of diversity). Much of the issues discussed and debated in the context of intercollegiate athletics can be juxtaposed with the contrast between performance-related and developmental goals.

Critics of the structure and processes of intercollegiate athletics argue that undue emphasis is placed on performance related goals at the expense of developing and educating the athletes (Brand, 2001; Duderstadt, 2000). While such debates are of interests in themselves, the issue posed in the study is the resources required to achieve each of the two sets of goals. For instance, if providing entertainment through athletic competitions is a goal of an intercollegiate athletic department, then quality facilities for competitions become critical resources. By the same token, the goals of developing and educating athletes would require the resources of academic counselors, study tables, etc. A major research question posed in the study is what resources are required to achieve a given set of goals of intercollegiate athletics.

Model of Resources and Outcomes in Intercollegiate Athletics
The proposed model for empirical verification is shown in Figure 1.1. The model incorporates three broad categories of resources (organizational, financial/physical, and human resources), and two broad categories of outcomes (performance and developmental outcomes). The model suggests that organizational resources are the driving force behind the generation of the other two forms of resources—financial/physical and human resources. The latter two forms of resources are said to
Goals | Descriptions
---|---
**Performance Goals**
Winning | Win-loss record, conference and national championships, and national rankings (Chelladurai et al., 1984).
Financial Security | Monetary surplus and financial security (Chelladurai et al., 1984).
Entertainment | Provision of entertainment to university members, local community, and national audience (Chelladurai et al., 1984).
University Visibility and Prestige | Image and prestige of the university in the community and the nation (Chelladurai et al., 1984).
National Sport Development | Excellence in Olympic sports and performance in world competitions (Chelladurai et al., 1984).

**Developmental Goals**
Student-Athlete Academic Achievement | Improvement and achievement in academics (Chelladurai et al., 1984).
Student-Athlete Health/Fitness | Fitness, health, and physical well-being (Chelladurai et al., 1984).
Student-Athlete Social/Moral Citizenship | Social, moral, and citizenship behavior of athletes (Chelladurai et al., 1984).
Student-Athlete Careers | Preparedness of student athletes for future careers (Chelladurai et al., 1984).
Organizational Culture of Diversity | Respect for, and acceptance of, all racial and ethnic groups (Coakely, 1994).

Table 1. 2: Intercollegiate Athletic Goals (Trail & Chelladurai, 2000)
influence both the performance and developmental outcomes.

The indicators of organizational resources are (a) athletic reputation, (b) academic reputation, (c) tradition, (d) endowments, (e) enrollment, (f) faculty size, (g) city population, and (h) school types. Financial/physical resources are indicated by (a) athletic expense, (b) operational budget, (c) recruiting budget, (d) numbers of athletic teams. The indicators of human resources are (a) numbers of coaches, (b) numbers of student-athletes, (c) coaches’ salary, and (d) athletic scholarships and aid.

The performance outcome is indicated by (a) Sears’ Directors Cup standing, (b) surplus/deficit of athletic department, (c) numbers of attendances, and (d) numbers of all-American athletes. Finally, the developmental outcome is indicated by (a) graduation rate, and (b) gender equity.

**Alternative Model**

There are other plausible alternative models assessing relationships among model constructs. The alternative model included in the present study takes a different conceptual approach in which intangible resources (i.e., organizational resources) are placed parallel with tangible resources (i.e., human and physical/financial resources). That is, organizational resources are not considered as contributing resources. Rather, the alternative model sees both tangible and intangible resources independently influencing the attainment of intercollegiate athletic goals (See Figure 1.2).
Figure 1.2: Alternative Model of Resources in IA
Purpose

In sum, this study focused on the dynamics of gaining competitive advantages by intercollegiate athletic departments by investigating the influences of various types of resources on the attainment of various goals of intercollegiate athletic departments. More specifically, the resources were grouped into the categories of (a) organizational resources, (b) physical/financial resources, and (c) human resources. The outcomes of intercollegiate athletics were broadly classified into (a) performance and (b) developmental outcomes. It was proposed to assess the ability of the sets of resources in predicting the attainment of the performance and developmental goals with structural equation modeling.

Definitions of Terms

For the purpose of the study, variables must be clearly defined. In regard to definitions of terms, there are two types of definitions often considered in research. A constitutive definition refers to “a formal definition in which a term is defined by using other terms” (Ary, Jacobs & Razavieh, 2002, p. 33). On the other hand, an operational (operative) definition is one type of defining terms that “ascribes meaning to a construct by specifying operations that researchers must perform to measure or manipulate the construct” (Ary et al., 2002, p. 33). Therefore, a constitutive definition is often called as a dictionary definition and an operative definition is about how variables in the study are measured (Fraenkel & Wallen, 2000). To provide clarification for the study, operational definitions for the variables in this study are presented in the following section.
1. **Resources** – Wernerfelt (1984) defined a resource as “anything which could be thought of as a strength or weakness of a given firm” (p. 172). More specifically, Barney (1991) defined firm resources as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness” (p. 101).

2. **Human Resources** – Barney (1991) suggests that human resources include the training, experience, judgment, intelligence, relationships, and insight of the workforce in the organization.

3. **Organizational Resources** – The term “organizational resources” refers to organizational culture, history, relationships, and trust, as well as the formal and informal organizational structure concerning planning, reporting, controlling, and coordinating systems (Barney, 1991, 1995).

4. **Physical Resources** – An organization’s physical resources consist of, but not limited to, plants and equipments, facilities, and buildings, as well as geographic location (Barney, 1991; Williamson, 1975).

5. **Goals** – In a dictionary term, a goal is defined as “the purpose toward which an endeavor is directed”. In the organizational contexts, Etzioni (1964) claimed that “goals depict a future state of affairs, guide organizational activity, and provide a source of legitimacy for an organization’s existence” (p. 5).

6. **Performance Goals** – Performance goals refer to ones that focus on winning of sport teams, university visibility and prestige, financial security, entertainment, and
national sport development through athletic-related activities (Trail & Chelladurai, 2000).

7. Developmental Goals – As a competing concept of performance goals, developmental goals concern with athletes. Thus, developmental goals include student-athlete’s academic achievement, health and fitness, social and moral citizenship, careers, and culture of diversity (Trail & Chelladurai, 2000).

Limitations

A limitation of the current study is related to the nature of the data sources. Since this study made use of the available data, the extent to which available data measure key concepts of the study may be the primary limitation. In addition, it was possible that the researcher may fail to find relevant information that represents variables and concepts. Such a failure in procuring data may lead researchers to exclude some variables.

Delimitation

This study was delimited to investigate athletic departments within NCAA Division I institutions. Since it was possible that the impact of resources on organizational effectiveness may differ across divisional levels, the results of the study may not be generalizable to other populations such as Division III athletic departments.
This chapter provides a review of the literature on the significance and the study of the resource-based view (RBV). It begins with a discussion of strategic management and the significance of the RBV, followed by conceptual issues regarding the RBV. Next, research on the RBV as related to organizational types and is reviewed.

**Strategic Management**

In search for organizational effectiveness in intercollegiate athletics, sport management scholars have investigated various factors and areas such as diversity management (Fink & Pastore, 1999), satisfaction and organizational commitment of coaches (Turner & Chelladurai, in press), organizational justice (Hums & Chelladurai, 1994) and so on. However, studies exploring how sport organizations sustain a competitive advantage remain under-represented (Mcquaughey, & Liesch, 2002). It seems that only a few studies of sport management have tried to apply recent strategic management concepts in the context of sports.

Strategic management focuses on concepts and areas affecting organizational performance (Hoskisson, Hitt, Wan & Yiu, 1999). Specifically, the main purpose of the field of strategic management, therefore, is “how firms achieve and sustain competitive
advantage” (Teece et al., 1997, p. 509). In regard to the search for the source of sustainable competitive advantage, two competing approaches (i.e., industrial-organization economics and the resource-based view) have recently drawn considerable attention. First, industrial-organization (IO) economics focus on external environment and structure of the industry and strategic industrial position (Porter, 1985). As this perspective points that structure (i.e., a reflection of the industry environment) determines conduct that determines performance, it is also known as the structure-conduct-performance (S-C-P) paradigm (Porter, 1980; 1985). In this paradigm, the most representative scholar might be Porter who proposed ‘the competitive forces approach (i.e., the Five Forces Model)’ (Teece et al., 1997). He viewed that an organizational performance is a function of the industrial environments and the external relationships among industrial actors (Porter, 1980). In his Five Forces Model, Porter (1980) suggested that (a) rivalry among existing firms, (b) threat of new entrants, (c) bargaining power of suppliers, (d) threat of substitute products or services, and (e) bargaining power of buyers are five forces that affect an organization’s behavior. In this sense, according to Porter (1980, 1985), the extent to which an organization gains competitive advantage depends on “how well it positions and differentiates itself in an industry” (Hoskisson et al., 1999, p. 426).

While Porter’s competitive forces approach allows organizations to examine their opportunities and threats in which they are competing, this perspective has some limitations. One of the issues in this approach is that the focus is on an industry or sub-sector rather than on an individual organization. In other words, the difference in rents among organizations is attributed to ‘economies of scale’ rather than the use of assets
(Teece et al., 1997). In this regard, Lado, Boyd, and Wright (1992) addressed that I/O theories may not suggest the ‘proactive’ strategies concerning competitive advantage, and that those theories tend to ignore the idiosyncratic firm resources that are potential sources of competitive advantages.

In contrast to industrial organization analysis (e.g., the Five Forces Model), the RBV focuses on internal aspects of an organization. The central tenet of the RBV is that sustainable competitive advantage of the organization comes from resources under its control and how those resources are used (Barney, 1991). Thus, this theory encourages organization to develop proactive strategies and generate idiosyncratic resources (i.e., firm-specific resources). Given that industrial organization theories do not give much proactive strategy and resides with the environmental determinism, the RBV seems to be a more voluntaristic, and thus viable, paradigm for organizations (Lado et al., 1992). In this regard, Zajac (1995) addressed the RBV as “one of the most important redirections of the [content of] strategy research in this decade” (p. 169).

Credentials of the RBV are well addressed in Conner’s (1991) paper in which she compared the RBV with five other schools of thoughts in organization economics (e.g., neoclassical theory’s perfect competition model). According to Conner, the RBV possesses both similarities (e.g., incorporates central tenets) and dissimilarities (e.g., rejects at least one central feature of each of I/O theories) with I/O theories, yet these dissimilarities may provide us a better understanding in competitive advantages. Further, she suggested that the RBV constitutes a theory of the firm because this theory is able to explain ‘why firm exists’ (i.e., creator of a positive value) and “what limits its size and scope’ (i.e., firm resources). In this regard, Mahoney and Pandian (1992) also suggested
that the RBV is a value-added theory of strategic management. They further argued that the RBV is intertwined with mainstream strategy theories and, moreover, it works as a complementary approach to I/O analysis.

In sum, it has been suggested that the RBV is a theory of the firm that can complement the previous approach and further can suggest proactive (or voluntaristic) strategies for sustainable competitive advantages. The concepts of the RBV are explained in the following section.

Resource-Based View

The primary idea of the RBV is to view an organization as a bundle of resources that contribute to the growth of the organization (Penrose, 1959). Thus, research in RBV have tried to answer the question “why firms are different and how firms achieve and sustain competitive advantage” (Hoskisson et al., 1999, p. 437).

While this theory was introduced to the field of strategic management in the mid 1980’s and became one of the dominant management frameworks in the 1990’s, the origin of the RBV starts with Penrose’s (1959) *the theory of the growth of the firm*. In her theory, she argued that “the firm is more than an administrative unit; it is also a collection of productive resources the disposal of which between different uses and over time is determined by administrative decision” (p. 24). As such, she considered the firm as a collection of productive resources that is defined as “the physical things a firm buys, leases, or produces for its own use, and the people hired on terms that make them effectively part of the firm” (p. 67). The recent popularity of the RBV was brought on by Wernerfelt (1984), who suggested analyzing a firm’s resource position to develop strategic options for the higher profitability. In his paper of “A Resource-based view of
the firm”, Wernerfelt (1984) analyzed the relationships between resources and profitability in terms of entry barriers and growth-share matrices. In regard to entry barriers, Wernerfelt proposed that a firm that holds a valuable resource can create a ‘resource position barriers’ that contain mechanisms of having advantages over both potential entrants (i.e., entry barriers) as well as incumbents. Thus, an organization possessing resource position barriers may achieve competitive advantages as being a first mover in the market as well as being defensive to other competitors. Based on the growth-share matrix, Wernerfelt developed a resource-product matrix in which the relative relationships between resources and products are identified. According to this matrix, organizations may achieve greater effectiveness by deciding entry timing of resources for productions of various products (e.g., sequential diversification of a resource), and by making a balance between developing and exploiting a resource. In regard to the second reason, a given firm can have more flexibility in strategic planning by looking at a portfolio of resources rather than looking at that of products of a given organization. Due to such reasons, Wernerfelt (1984) argued that the resource-based view of the firm can be utilized to understand competitive advantages.

In 1990’s, Barney (1991) introduced another seminal paper on the RBV in which he proposed the firm resource model that explains the source of sustainable competitive advantages. In his view, it is the potential of firm resources that generate sustained competitive advantage. Therefore, Barney (1991) suggested that organizations should analyze the potential of their resources based on certain criteria of resource attributes (e.g., value). Further, he suggested informal strategic planning, information processing systems, and positive reputations as possible examples of competitive advantages.
In sum, the RBV sees that resources with a certain attribute or a combination of attributes (e.g., valuable and rare resource) are the sources of competitive advantages of organizations and thus encourages organizations to formulate strategies based on the analysis of resources. In the following, the key concepts and the theory are discussed.

**Resources**

For better understanding of the RBV, the definition of resources should be explored as it is the conceptual cornerstone of the theory. In the traditional economics literature, the term ‘resources’ refers to ‘factors of production’ that are the inputs used to produce goods and services. In the RBV literature, the basic concept of resources are same, yet there are some differences in that the economics literature tends to ignore some types of resources (e.g., technological skills) that do not fit into mathematics used by economists (Wernerfelt, 1984). As stated earlier, the basic definition of ‘resources’ goes back to Penrose’s (1959) work in which she defined the term ‘resource’ as “the physical things a firm buys, leases, or produces for its own use, and the people hired on terms that make them effectively part of the firm” (p. 67). While Penrose broadly stated the term ‘resources’, yet her definition is somewhat limited to assets of the firm. With the re-introduction of the RBV, definitions of resources became broader and inclusive. For example, Wernerfelt (1984) defined a *resource* as “anything which could be thought of as a strength or weakness of a given firm (1984, p 172).” In his definition, the term resource includes both tangible and intangible assets for the firm. Barney (1991) uses the study of Daft (1983) to define the term *firm resources*. In his study, firm resources are defined as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that
improve its efficiency and effectiveness” (p 101). Similarly, Godfrey and Gregersen (1999) defined resources as “those assets, skills, knowledge, etc., that create and sustain competitive advantage; however, all a firm’s assets are not resources, only those assets that lead to economic rents” (p. 38-39). Some scholars approached the meaning of resources from a perspective concerning their utility. For example, Grant (1991) addressed that “resources are inputs into the production process, thus they are the basic units of analysis” (p. 118). Hitt, Bierman, Shimizu, and Kochhar (2001) also suggested “resources are the basis for and facilitate the implementation of firm strategy” (p. 16).

In sum, the current study sees ‘resources’ as anything that can be considered as the units of analysis in strategy formulations (Barney, 1991; Grant, 1991; Wernerfelt, 1984). In the following, resource attributes that can bring sustainable competitive advantage will be described.

Resource Attributes

By definition, the term ‘resources’ may refer to “anything which could be thought of as a strength or weakness of a given firm” (Wernerfelt, 1984, p. 172). However, the thing we have to keep in mind is that not all assets are resources (Godfrey & Gregersen, 1999). Only those assets that lead to above normal rates of return can be called ‘resources’ because not all resources and capabilities have the potential of sustainable competitive advantage (Barney, 1991; Godfrey & Gregersen, 1999). In RBV theory, it is assumed that the potential of sustainable competitive advantage comes from the heterogeneity and immobility of resources (Barney, 1991). Where resources are evenly possessed by each competitor (i.e., homogeneity) and are easily obtainable (i.e., mobility), there cannot be any competitive advantage. Given that most of resources are
heterogeneous and immobile to some degree, not all firms can implement the same strategy and, thus, cannot expect same effectiveness (Barney, 1991; Barney & Hoskisson, 1989). Further, it is suggested that these two general characteristics of resources (i.e., heterogeneity and immobility) are associated with first mover advantages and mobility/entry barriers (Barney, 1991). In regard to first mover advantages (Lieberman & Montgomery, 1988), an organization may enjoy competitive advantage as a first mover because a focal organization can implement a unique strategy with heterogeneous and immobile resources before other competitors do. In terms of mobility/entry barriers, resources that are heterogeneous and immobile become barriers of mobility and entry of other organization because other competitors cannot possess same resources in order to implement the same strategy (Barney, 1991). Based on the assumption concerning heterogeneity and immobility of resources, four resource attributes that have the potential of sustainable competitive advantage were suggested. Those attributes are value, rareness, imperfect immimitability, and non-substitutability (Barney, 1991). In the RBV, the extent to which resources are valuable, rare, imitable, and substitutable is considered as indicators of (a) the degree to which a given resource is heterogeneous and immobile and (b) has the potential to generate sustainable competitive advantages (Barney, 1991).

*Value.* In the RBV, value is defined as “the fit of the resource or factor to strategy combined with the fit of the strategy to the external environment” (Black & Boal, 1994; p. 132). Value of resources is the most basic resource attributes to have the potential of sustainable competitive advantage because valuable resources enable an organization to implement effective strategies that exploit opportunities and neutralize possible threats (Barney, 1991).
**Rareness.** Not all valuable resources can be sources of sustainable competitive advantages if the majority of competitors can obtain valuable resources in a given industry. To have the potential of sustainable competitive advantages, an organization should implement an effective strategy with valuable yet rare resources so that other competitors may fail to implement the same strategy due to the lack of relevant resources (Barney, 1991). Therefore, the degree to which a specific resource is rare depends on “the combination of physical rareness in the factor market and/or the rareness of the perceived value of the resource due to a firm’s particular resource combination” (Black & Boal, 1994). In other words, the rareness of resources concerns whether a valuable resource (or a bundle of resources) is possessed by a small number of competitors so that they can generate competitive advantages.

**Inimitability.** As stated above, valuable and rare resources have the potential of competitive advantages that are related to first-mover advantages (Barney, 1991). Nevertheless, valuable and rare resources should possess another attribute (i.e., imperfect imitability) to be sources of sustained competitive advantages because inimitable resources prevent competitors without these resources from obtaining them (Barney, 1991). In this sense, inimitability is defined as “the continuation of imperfect factor markets via information asymmetry such that resources cannot be obtained or recreated by other firms without a cost disadvantage” (Hoskisson et al., 1999).

**Non-Substitutability.** The substitutability of resources refers to the availability of a substitute for a valuable, rare, and inimitable resource (Barney, 1991). With inimitability, non-substitutability enables a given resource to have sustainable competitive advantage. The degree of substitutability depends on “the continuation of
imperfect factor markets, the costs involved in the recreation of specific combination, or the cost of finding a new combination of resources that will enable the firm to compete for the same product market” (Black, & Boal, 1994, p. 132).

In sum, assets and skills that an organization has cannot be considered to be ‘resources’ unless those assets and skills possess these four attributes (Amit & Schoemaker, 1993). In the RBV, these four attributes can be used to assess the economic implications of the resources because an organization with such qualified resources can make superior economic performance (Godfrey & Gregersen, 1999; Hoskisson et al., 1999). In the following, the reasons how such resource attribute may produce economic returns will be addressed.

*Rent*

In understanding the theory of the RBV, the term “rent” should be addressed given that the primary purpose of strategic management (e.g., strategy) is to search for competitive advantage or what is called “rent” (Bowman, 1974; Teece et al, 1997). Simply put, the RBV refers to an approach that “focuses on costly-to-copy attributes of the firm as sources of economic rents and, therefore, as the fundamental drivers of performance and competitive advantage” (Conner, 1991, p. 121).

The term “rent” in academic literature refers to economic profit on opportunity cost. In detail, rent is “the surplus of revenue over ‘real’ or ‘opportunity’ cost of the resources used in generating that revenue” (Grant, 1991, p. 134). From the RBV perspective, it is suggested that resources that are valuable, unique, imperfectly imitable, and nonsubstitutable can generate economic rents (Godfrey & Gregersen, 1999). Thus,
understanding the relationships between resource attributes (e.g., value) and rents is important.

It is suggested that there are three major types of rents related to the RBV (Mahoney & Pandian, 1992). Ricardian rent refers to firms possessing superior resources can produce same products with lower average costs in comparison to other competitors (Ricardo, 1817). Monopoly rents can be enjoyed by deliberately restricting output (Bain, 1968). Quasi-rent refers to “the excess of an asset’s value over its salvage value or its value in its next best use” (Peteraf, 1993, p. 184). This quasi-rent can be appropriated by having firm-specific resources (Williamson, 1979).

One of the basic assumptions in the RBV is that a resource or a bundle of resources have the characteristic of “heterogeneity” (Barney, 1991). Since each organization has heterogeneous resources in producing the same item, each organization differs in production efficiency. Given that each organization competes in the same market with heterogeneous resources, organizations with superior resources (i.e., valuable and rare resources) can earn economic rents while those with marginal resources are unable to make economic profits in excess of breakeven (Peteraf, 1993). Since valuable resources are associated with higher level of efficiency, organizations with valuable resources can expect economic rents (i.e., Ricardian rents) in a given time (especially in the initial periods).

The notion of resource heterogeneity is also applicable to monopoly rents in a market where organizations with superior resources can generate economic profits by controlling output. Since organizations with superior resources can formulate a collusive
group that can raise intra-industry mobility barriers, such resource attributes as value and rareness are considered to be critical to gain monopoly rents (Peteraf, 1993).

It is said that imperfectly substitutability and nonimitability are characteristics of firm-specific resources that create quasi-rents where quasi-rents (or pareto rents) refers to the excess of a resource’s first-best use value over the its second-best use value (Klein, Crawford & Alchian, 1978). Teece et al. (1997) explained how firm-specific resources may gain quasi-rents. They argued that firm-specific resources (e.g., trade secrets, specialized production facilities, engineering experience) may generate rents because “such assets are difficult to transfer among firms because of transactions costs and transfer costs, and because the assets may contain tacit knowledge” (p. 516).

In the RBV, one of important things is to understand that the extent to which a resource possesses the potential of rent-generation can be explained by the combinations of resource attributes (Godfrey & Gregersen, 1999). More specifically, the value and rareness of resources are more related to generate economic rents in the initial periods (or in a given time) while non-substitutability and imperfect imitability influence on retaining rents over time (Dierickx & Cool, 1989; Godfrey & Gregersen, 1999) (See Figure 2.1).

This tells us that identifying resources that generate economic rents is one of the most critical tasks for managers because an organization can expect competitive advantage by analyzing and assessing the assets under control (Barney, 1986). In this regard, understanding categorizations of resources may be beneficial.
Figure 2.1: Resource Attributes and Rents
Resource Categorization

The profile of resources affects strategic activities of a focal organization that look for economic rents (Bowman, 1974; Collis, 1991). Given that resources are the basic unit of strategy formulations (Grant, 1991), a proper categorization of resources might be required as a useful starting point to identify and appraise a firm’s resource (Grant, 1991). Assessing a firm’s resource profile has been a traditional focus within strategic management (Mahoney & Pandian, 1992). Also, Teece, et al. (1997) addressed that “the strategic posture of a firm is determined not only by its learning processes and by the coherence of its internal and external processes and incentives, but also by its specific assets” (p. 521) and suggested that “such assets determine its competitive advantage at any point in time” (p. 521). In this regard, Aaker (1989) noted that sustainable competitive advantages may be realized by proper management of assets, and skills (i.e., resources) which begins with the identification of the critical resources and their contributions to successes and failures of organizations. Thus, resource categorization may help us to understand a picture of the firm’s resource base, thus help us to apply the concepts into sport contexts.

In the economics literature, resources or ‘factors of production’ refer to the inputs used to produce goods and services such as natural, capital, and human resources. The resource classifications of the RBV are similar to that of economics literature, yet there exist differences concerning the profile of resources. In the traditional economics literature, economists only look for economic units that exhibit declining returns to scale, and thus they tend to not consider such resources as know-how that do not comply with
the economic theory of factor demand (Wernerfelt, 1984). On the other hand, the RBV is especially interested in such resources that may be neglected in the traditional economics.

As one of cornerstone of the resource categorizations, Barney (1991) suggested a resource categorization that consists of physical, human, and organizational resources. Barney (1991) addressed that “physical capital resources include the physical technology used in a firm, a firm’s plant and equipment, its geographic location, and its access to raw materials. Human capital resources include the training, experience, judgment, intelligence, relationships, and insight of individual managers and workers in a firm. Organizational capital resources include a firm’s formal reporting structure, its formal and informal planning, controlling, and coordinating systems, as well as informal relations among groups within a firm and between a firm and those in its environment” (p. 101). Later, Barney (1995) adds one more resource category, financial capital resource (e.g., debt, equity, and retained earnings). In addition to Barney’s well-known categorizations, scholars have suggested different or extended categorizations based on industries and conceptualizations. The work of Hofer and Schendel (1978) often used by other scholars such as Grant (1991) and Mahoney and Pandian (1992). Hofer and Schendel (1978, p. 144-153) suggested that a resource profile combines the following resources and capabilities: (a) Financial resources (e.g., cash flow, debt capacity, new equity availability); (b) Physical resources (e.g., plant & equipment, inventories); (c) Human resources (e.g., scientists, production supervisors, sales personnel); (d) Organizational resources (e.g., quality control systems, corporate culture, relationships); (e) Technological capabilities (e.g., high quality production, low cost plants). Grant (1991) points out that firms often fail to see all resources evaluated since management
information system often ignores intangible resources (e.g., skills, knowledge, and reputation). Even though these intangible resources are important for the organizations, these resources have been ignored because these types of resources are difficult to be priced and quantified. Based on the work of Hofer and Schendel (1978) and with a stress on intangible resources, Grant suggests six categories of firm resources: financial, physical, human, technological, reputation, and organizational resources. Shapiro (1999) looks at the RBV literature to find types of resources that are relevant to Informational Technology (IT) industry. Based on the works of Barney (1991) and Mahoney and Pandian (1992), Shapiro adapts and suggested six types of resources. Those are physical, human, financial, organizational, information technology, and marketing resources. In addition, Shapiro notes that legal resources (e.g., patents and contracts) have been ignored by the RBV literature, thus he suggests add legal resources as important resource categorizations. Likewise, some scholars also suggested unique or additional types of resources. For example, Mosakowski (1999) and Alvarez and Busenitz (2001) mentioned entrepreneurial resources that is defined as “the capacity to identify, develop, and compete new combinations of existing asset bundles or new asset configuration” (Godfrey & Gregersen, 1999, p. 41). In addition, marketing literature mentioned marketing specific resources such as brand name and reputation (Srinivasta, et al., 2001).

As illustrated, the RVB scholars have suggested different typologies such as reputational- (Deephouse, 2000), marketing- (Srinivasta et al., 2001), and entrepreneurial resources (Mosakowski, 1999). However, what they have suggested may fall into Barney’s “socially complex resources and capabilities” such as reputation, tradition, teamwork, culture, and trust (i.e., organizational resources) because examples of new
typologies include brand reputation and stakeholder relations. In addition, it seems that Barney’s (1991) resource categorizations fit very well with sport organizations as in the case of Putler and Wolfe (2000). By taking broader typologies of resources (i.e., Barney’s typology), this study may increase the chance of exploring the unique impact of each resource.

One of the important things in resource categorizations is well addressed by Penrose (1959). She suggested that “a resource may be conveniently classified under a few headings – for example, land and equipment, labor (including workers’ capabilities and knowledge), and capital (organizational, tangible and intangible) – but the subdivision of resources may proceed as far as is useful for the problem at hand” (p. 74). In this regard, the current study believes that Barney’s (1991) original categorizations is the best option for the problem in intercollegiate athletics in that the current study is interested in finding a broad type of resources. Based on the result of this exploratory study, I expect that the future studies can identify more specific resources that bring sustainable competitive advantages for athletic departments.

**Tangible and Intangible Resources**

The tangibility of resources is one of the critical criteria to categorize resources of the organization. In this regard, resources could be grouped into two types: tangible and intangible resources (Caves, 1980). Examples of intangible resources are numerous. Hall (1992) used following examples to illustrate examples of intangible resources in business. Those are trademarks, patents, copyright, registered designs, contracts, trade secrets, reputation, and networks as well as know-how and culture (Hall, 1992).
The valuation of intangible resources seems to be more difficult in terms of accounting and applying into economics formulae in comparison to tangible resources. Yet, the value of intangible resources is often greater than that of tangible resources. As Hall (1992) illustrated, the price of a firm’s stock is the reflection of the firm’s tangible (e.g., facilities) and intangible resources (e.g., reputation). However, intangible resources of a firm play a bigger role in determining a market price of a stock in comparison to tangible resources. In this regard, the importance of intangible resources in the RBV is well documented. For example, Godfrey and Hill (1995) noted that “the more unobservable a resource, the higher are the barriers to imitation, and the more sustainable will be a competitive advantage based upon that resources” (p. 523). Itami and Roehl (1987) emphasized that the importance of invisible assets such as reputation in the process of strategy formulations.

Hall (1992, 1993) suggested that intangible resources might be further classified as ‘assets’ and ‘skills’ depending on the extent to which each resource can be owned. According to Hall, one of the critical aspects of ‘intangible resources which are assets’ are that they are protected by various laws and regulations (e.g., property rights). This type of resources includes patents, trademarks, copyright and registered designs, contracts, trade secrets and data bases. Most of all, reputation and networks (i.e., relationships) are critical assets of intangible resources in that they belong to organizations. Especially, the intangible resources of reputation is critical in achieving competitive advantage because highly reputed organizations can differentiate their products or themselves via their reputation as well as they can be in a defendable position with their fame and esteem (Hall, 1992). On the other hand, ‘intangible resources which
are skills’ include know-how and organizational cultures. Often, the term ‘competences’ is used interchangeably with skills.

In Hall’s (1992) study concerning CEOs’ perceptions of the role of intangible resources in the U.K., company reputation and product reputation were considered as the most important intangible resources to the overall success of the business among 13 types of intangible resources, followed by know-how, culture, and networks. Further, CEOs in his study also indicated that they would need more time to recreate or build up (i.e., replacement period) the intangible resources of company reputation and product reputation in comparison to other intangible resources. In the subsequent case study concerning intangible resources, Hall (1993) confirmed the importance of positional (e.g., reputation) and cultural (e.g., organizational culture) resources as sources of competitive advantage.

Based on empirical studies, Hall (1992) argued that “intangible resources are the ‘feedstock’ of the four capability differentials” (p. 143) where four capability differentials refer to functional (e.g., knowledge), positional (e.g., reputation), cultural (e.g., organizational culture), and regulatory differentials (e.g., contracts). In addition, one unique argument of the RBV is that the theory stresses the importance of imperfect imitability and substitutability, and imperfect imitability in particular (Peteraf, 1993). According to strategic management literature (Dierickx & Cool, 1989; Peteraf, 1993; Rumelt, 1984), the paths that organizations take may produce “nontradeable assets” which develop and accumulate within the firm (Dierickx & Cool, 1989) and such assets are extensively influenced by history (i.e., organizational resources). Based on Barney’s (1991) argument, most of intangible resources fall into ‘socially complex resources and
capabilities’ (i.e., organizational resources). Given that intangible resources can take on many different forms (Schoenecker & Cooper, 1998), the current study will use the labeled “organizational resources” for intangible resources. Therefore, consistent with Hall’s perspective, the current study conceives of the intangible resources (i.e., organizational resources) as contributing resources in that they can facilitate the generation of the more tangible resources. In detail, the basic argument of this study, therefore, is that organizational resources may influence attaining financial and human resources.

We have no doubt that financial resources (e.g., equity, retained earning) are valuable for each athletic department yet not all athletic departments can attain same amount of financial resources as other competitors are capable of. Here, the current study argues that generating financial resources may be influenced by other types of resources, say organizational resources. Studies in alumni donations have suggested that alumni contributions are, to a great extent, the functions of the institutional characteristics and level (Cunningham & Cochi-Ficano, 2002). While charitable giving of alumni is just one example of financial resources, this relationship has a great implication given the situation that alumni donations is the biggest source of athletic operations. Furthermore, the relationship between two types of resources may be applicable in general. For example, sponsorship money and endowments are provided by others who wish to associate with a focal institution or athletic program.

In regards to human resources in intercollegiate athletics, student-athletes and coaching staffs may be the most critical two groups of human resources. College-choice literature have suggested that athletic and academic reputation as well as available
majors, and institutional location to be factors critically influencing college-choice of
student athletics (Letawsky, Schneider, Pedersen, & Palmer, 2003; Reynaud, 1998).
According to RBV literature, such factors as athletic and academic reputation fall into the
realm of organizational resources that may contribute to generate better human capital
resources. By the same token, organizational resources may work as one of the critical
recruiting attribute for athletic department employees. While financial gains (e.g., salary)
do matter for employees (e.g., coaches), people give great meaning to the organizations
that they are associated with. In this sense, the current study argues that organizational
resources, rather than financial resources, contribute to attain human resources for
organizations.

The RBV in Intercollegiate Athletics

Since the RBV became popular in 1990’s, there have not been many studies that
applied the concepts of the RBV in the sport management literature, and particularly in
intercollegiate athletics. Given that the multi-dimensional impacts (e.g., economic,
social) of intercollegiate athletics on our society, it seems that the sources of sustainable
competitive advantage in intercollegiate athletics are understudied. Yet, recently a few
studies have applied the RBV framework in intercollegiate athletics. As notable
examples of the RBV in sport management, Smart and Wolfe (2000) analyzed the
reasons for the success of NCAA Division I football programs in terms of resources.
Recently, Cunningham and his associate (Cunningham, 2003; Cunningham & Sagas, in
press) address the importance of human resources in the success of intercollegiate
athletics.
Smart and Wolfe (2000) utilized the conceptual framework of the resource-based view of the firm. In their study, they utilized the conceptual framework of Barney (1991) and explored the most critical resource for the success of intercollegiate athletics football programs. Among financial, human, and organizational resources, they concluded that organizational resources of the Penn State Football program were the source of the sustainable intercollegiate athletic program success. Especially, they suggested that the coaching staff’s long tenure contributed to the organizational resources as history, relationship and trust among organizational members, and organizational culture.

Based on the RBV, Cunningham (2003) focused human resources to explore the relationship between human resources and competitive advantages of athletic performance of intercollegiate athletic departments. He found that factors related to human resources (i.e., coaches’ salary and recruiting budget) have correlations with the performance of athletic programs in terms of winning and championships. Based on his findings, he suggested that the management of human resource can be sources of competitive advantages in intercollegiate athletics.

In addition, the other missing point of this research is that no research has been explored the source of the athletic department’s success. As Smart and Wolfe (2000) and Cunningham (2003) noted, there is a need to investigate about the strategies of athletic department as a whole. Even though Cunningham (2003) investigated the intercollegiate athletic department as a whole, he just focused on human resources as sources of competitive advantage. Thus, it may possible to lose sight of the broader picture for the sustainable competitive advantages in intercollegiate athletics. What we are interested in this study is to investigate what is more generally important for each athletic department.
Specifically, we focus on critical types of resources depending on types of success criteria.

Resources and Organization Types

According to Becker and Gordon (1966), an organization is defined as “a purposely developed system, i.e., an ongoing interaction of procedures and resources, to which an owner has property rights” (p. 319). In a similar manner, it is suggested that an organization is a system in which resources and procedures are coordinated to achieve a goal or a set of goals (Gordon & Morse, 1968). The above arguments illustrate to us that resources are necessary to attain their organizational goals that are the reasons for the existence. Then, the next question comes up is what determine the criticalness of each resource. In this regard, theories suggest that the relative criticalness of resources varies across industrial and organizational types. When it comes to different industries, the relative importance of each resource would be quite clearly different in that each industry needs different resources to produce their own products. For example, what is most critical for a service organization (e.g., sport agency firm) is different from that of a manufacturing organization (e.g., sport goods manufacturer).

From a sociological perspective, it is said that organizations can be classified in terms of ‘type of goal or function’ of organizations (Parsons, 1956). Based on the functions of a social system (i.e., orientation), Parsons suggested that organizations can be classified as organizations oriented to (a) economic production (e.g., business firms), and (b) political goals (e.g., government organizations, labor unions), as well as (c) integrative organizations (e.g., the law firm that adjusts conflicts), and (d) pattern-maintenance organizations (e.g., churches and schools). From a narrower perspective
one of the approaches concerning the organizational typology in a given industry is to sort various organizations based on a manner in which an organization makes a tradeoff between economic and non-economic goals (Acar, Aupperle, & Lowy, 2001). Based on this spectrum, organizations are classified by a 5-typology (i.e., privately-held for profits, publicly-traded for profits, regulated for profit, revenue-generating not-for-profit, and non-revenue-generating not-for-profit). Since each type of organization has different priorities of goals, resources prioritized across organizational types would be different (Gordon & Morse, 1968).

Again, one thing we have to keep in mind is that organizations allocate resources to achieve a certain goal (Parsons, 1956). In addition, one of the common attribute of organizations is that they have multiple and/or conflicting organizational goals (Simon, 1964). The combination of these two facts illustrates that different goals require different types of resources within a single organization. In our context, intercollegiate athletics departments are carrying out multiple goals, namely educational and athletic goals (Trail & Chelladurai, 2000). Parson's typology also suggests that collegiate athletic departments can be associated with two or more groups (i.e., organizations oriented economic production, pattern-maintenance organizations) in which different types of goals are prioritized. Given that (a) athletic departments hold multiple goals and (b) each goal requires different resources, the current study uses organizational goals as the criteria determining the relative criticalness of each resource. In the following, the concepts of goals are described in detail.
Intercollegiate Athletic Goals

Goals are defined as “the purpose toward which an endeavor is directed”. Given that the organizational effectiveness can be defined by the degree to which an organization achieves its predetermined goals, understanding the concepts of goals is critical for managers. Before we discuss more about goals, we should notice that the relative importance of each intercollegiate athletic goal is of less concern to the current study in that this study is interested in necessary resources for each goal. This study assumes that institutions differ in the extent to which they prioritize intercollegiate goals because each institution has different goals and purposes. Therefore, exploring critical resources for various types of goals is the main focus of the study.

In management science, one of organizational attributes is a multi-dimensionality of organizational goals and effectiveness (Chelladurai, 1999). This is especially true to the context of intercollegiate athletics. There are, therefore, substantial controversies concerning the concepts and criteria of organizational effectiveness in collegiate sports (Putler & Wolfe, 1999). While amateurism is one of the most important core values and goals in collegiate athletics, the influence of commercialism and professionalism have penetrated into intercollegiate athletics. It is deemed that the unique setting of intercollegiate athletics makes the concepts of organizational effectiveness (thus, the direction of organizational goals) more ambiguous and complex. Depending on perspectives, an athletic department can be viewed as an agent of the institution while considered as an independent enterprise. An athletic department can be considered as an agent of higher education in a sense that they focus on academic implication of collegiate sports (e.g., academic opportunity and role modeling) and athletic programs are getting
(in)visible resources from the institution. On the other hand, it also acts like an independent entertainment enterprise in a sense that it has unique power endowed from the institution as well as it pays a great deal of attention to non-academic issues (e.g., making ‘profits’) due to the great pressure concerning revenue generation and winning programs. The issue concerning intercollegiate athletic goals can be also explained by the concept of stakeholders. With this perspective, the relative importance of goals can be decided by “who is the primary stakeholder” or “who should be the beneficiary”.

In sum, the goals of intercollegiate athletics are not isomorphic unlike that of corporate sectors where shareholders’ financial profits are considered to be the most critical. Given that different types of goals require different resources from the organization, this study will discuss critical goals in intercollegiate athletics and then continue to discuss the relationship between goals and resources.

Before looking up sport management literature in this regard, this study looked up a broad yet important guideline provided by the NCAA concerning collegiate athletic goals. As one of the NCAA task forces, the Knight Commission (1991) suggested a “one-plus-three” model that focuses on presidential control in order to achieve following three goals: (a) academic integrity, (b) financial integrity, and (c) certification. According to the Knight Commission recommendations, presidents with endorsed authority from trustees should control conferences, and the NCAA as well as all aspects of intercollegiate athletics including institutional involvement with commercial television. Under the influence of the presidential control, each institution in the NCAA must achieve the integrity in education, finance, and athletics (i.e., one-plus-three). In detail, academic integrity concerns initial eligibility (e.g., stronger eligibility
requirements), graduation rate (e.g., graduation rate as a criterion for NCAA certification), and the letter of intent (e.g., more flexible terms) of student-athletes. Financial integrity is about reductions in athletic costs, and longer-term contracts of coaches as well as institutional controls on booster clubs and coaches’ income. In addition, NCAA certifications should be adopted to ensure governance and commitment to rules compliance, academic integrity, fiscal integrity, and equity, welfare and sportsmanship. Consistent with the one-plus-three model, the Knight Foundation Commission later pointed out academic transgressions, a financial arms race, and commercialization as three fundamental problems in collegiate sports (The Knight Foundation, 2001).

Since the reasons for such recommendations are rooted from the reforms of intercollegiate athletics, goals in the one-plus-three model might lay weight on one side of collegiate sports. In this regard, several sport management scholars might give us a better profile of diverse goals in intercollegiate athletics. In Canadian interuniversity contexts, interuniversity athletics goals and importance of each goal have been studied and examined by Chelladurai and his colleagues (Chelladurai & Danylchuk, 1984; Chelladurai, Inglis, & Danylchuk, 1984). Based on the concept of operative goals of Perrow (1961), Chelladurai and his associates distinguish official goals and operative goals in intercollegiate athletics. Throughout three stages of elaborate procedures, nine operative goals were suggested in the development of the Scale of Athletic Priorities. After the extensive data collections from written materials (e.g., newspaper and annual reports of university), thirteen experts from two Canadian universities examined and verified the relevance of objectives and suggested 11 objectives. And using Canadian
university students as sample, the internal structure of the scale and reliability were checked and the result generated nine objectives. Nine operative goals are: (a) Entertainment; (b) National Sport Development; (c) Financial; (d) Transmission of Culture; (e) Career Opportunities; (f) Public Relations; (g) Athlete’s Personal Growth; (h) Prestige; and (i) Achieved Excellence. The result of this study was somewhat consistent with the previous study of effectiveness criteria in intercollegiate athletics (Chelladurai, Haggerty, Campbell, & Wall, 1981). In this study of effectiveness criteria, some of factors are identical to those of the study in Athletic Priorities. Those similar factors are: Achieved excellence, Spectator interest (Entertainment), Career opportunities, Satisfaction of athletes and Competitive opportunities (Athlete’s Personal Growth), Sharing of costs and Operating cost (Financial). While such criteria as Adequacy of Facilities, Sport Characteristics, Student Recruitment, and Life Sport were not specified in the Athletic Priority study, those factors are closely related to success of intercollegiate athletics.

In the subsequent study, Chelladurai and Danylchuk (1984) empirically tested the Scale of Athletic Priorities with ninety interuniversity athletic administrators from Canada. Interuniversity athletic directors in Canada generally prioritize Transmission of Culture, Athletes’ Personal Growth, Public Relations, and Prestige. The result of this study also revealed that there are differences in priorities by subgroups (e.g., gender, conference membership, and size of university).

In the series of studies concerning legitimate conduct in intercollegiate athletics, Baxter and his colleagues mentioned several orientations of athletic programs. They addressed that:
Community pride, amateur athletic ideals, and a great deal of money are all at stake in the competitive world of intercollegiate athletics. Tension exists not only between athletic and academic excellence but also between competition for spectator and television dollars and the ideal of amateur athletic competition (Baxter, Margavio, & Lambert, 1996, p 51).

In their study, we should notice that they mentioned such words as spectator (i.e., fan support), the ideal of amateur athletic competition (i.e., sport development) and suggested such orientations toward winning and profit, education, and harmony with NCAA rules. The study of Baxter et al. has good implication to understand the relationship between goal orientations and possible illegitimacy in processes and administrations.

Literature from performance appraisal and coaching evaluation are helpful to understand goals of intercollegiate athletics. Barber and Eckrich (1998) suggested eight criteria for evaluating intercollegiate basketball coaches and seven for cross country coaches. The eight criteria for basketball coaches are; (a) Technical/skill development; (b) Fundraising skills; (c) Program success; (d) Public relations; (e) Coach-player relationships; (f) Administrative skills; (g) Role model; and (h) Support of student-athletes model. And the seven criteria for cross country coaches are; (a) Player development; (b) Public relations/ Program promotion; (c) Program success; (d) Role model; (e) Fundraising skills; (f) Academic integrity; and (g) Organizational skills. Even though not all criteria can be used to determine program success, some or many criteria of performance appraisal can be helpful to understand program success. It seems that some of the criteria are not explicit and need to be indirectly inferred. For example, such
criteria as role model and support of student-athletes model can be interpreted as athletes’ personal growth in the study of Chelladurai and his associates.

In recent literature, Putler and Wolfe (1999) suggested seven factors determine perceptions of success of intercollegiate athletics through in-depth interviews with various individuals (e.g., stakeholders). Based on interviews, seven factors (or criteria) were proposed: (a) success on the “field” (operationalized as win-loss records); (b) student athletes education (graduation rates); (c) athletic program ethics (NCAA violations); (d) interest in athletics (attendance); (e) gender equity (proportion of female athletes compared to the proportion of female undergraduates); (f) breadth of program offerings (number of teams); and (g) the extent to which an athletic program is self-supporting (financial surplus or deficit). Their study included six stakeholder groups as their sample (i.e., students, prospect students, alumni, student-athletes, athletic department employees, and faculty members). Using conjoint analysis, the result of their study revealed that graduation rates, violations, win-loss record, and finances are important factors consisting perceptions of success in intercollegiate athletics while attendance, gender equity, and number of teams are less important factors for all stakeholder groups.

In the subsequent studies of Wolfe and his associates (Smart & Wolfe, 1999; Lee, Wolfe, & Won, 2001), four or six of success criteria were used. With a resource-based view as their framework, Smart and Wolfe (1999) examined the relationship between resources and athletic success of intercollegiate athletic program (i.e., Division I football program). In this study, four program outcomes (i.e., wins, student athlete education, athletic program ethics, and financial performance) contributed to athletic program
success. They concluded that organizational resources (e.g., history and coaching tenure) contribute most to the athletic program success in the Division I football program. In other study, perceptions and priorities concerning intercollegiate athletics success across nations and cultures were explored. Six program outcomes were used: win-lose record, graduation rate, program ethics, attendance, gender equity, and financial surplus. The result of the study revealed subgroups (i.e., by nations and cultures) differences concerning win-loss record and graduation rates. Further, the four-cluster solution merged as the best solution and, consistent with previous study, four clusters are named as win, education, ethics, and revenue.

Trail and Chelladurai (2002) applied the previous study of Chelladurai and his colleagues to the context of the United States. Through an extensive review and analysis of literature and subsequent field and pilot study, ten goals of intercollegiate athletics were advanced in their study. Those 10 goals are: (a) Student-athlete academic achievement; (b) Student-athlete health/fitness; (c) Student-athlete social/moral citizenship; (d) Organizational culture of diversity; (e) Student-athlete careers; (f) University visibility and prestige; (g) Financial security; (h) Winning; (i) Entertainment; and (j) National sport development. Further, the perceptual differences of stakeholder groups (i.e., students and faculty members) concerning goals and approval of processes in intercollegiate athletics were explored. The result of this study revealed that the relative importance of goals is different by stakeholder memberships and gender. Based on this study, faculty members weigh more importance on developmental goals (e.g., academic achievement and health/fitness) and consider performance goals (e.g., visibility and prestige, financial security, and winning) are less important. For students group, while
the importance of developmental goals is same, students weigh considerably more importance to performance goals in comparison to faculty members.

In the subsequent study, Trail and Chelladurai (2002) examined the influences of personal values on intercollegiate athletic goals and approval of processes with two groups of samples (i.e., students and faculty) in the U.S. To administer this study, they used Schwartz (1992)’s Value Scale, and Trail and Chelladurai’s Scale of Athletic Department Goals and Scale of Athletic Department Process (2000). The result of this study revealed that stakeholders’ values influence the importance attached to goals and approval of processes.

The review of literature suggests that the seminal works of Chelladurai and his associates can provide a substantially sound framework concerning intercollegiate athletic goals. Thus, the current study utilized the intercollegiate athletic goals suggested by Trail and Chelladurai (2000). In the following chapter, the methodology used to explore the relationship between impacts of resources and the attainment of intercollegiate athletic goals will be explained.
CHAPTER 3

METHODOLOGY

This section outlines the methodological procedures to be used for assessing the relationship of resources on the attainment of intercollegiate athletic goals. This chapter is organized into five sections: (a) research design, (b) selection of sample, (c) study variables, (d) data collection procedures, and (e) data analysis procedures.

Research Design

Types of Research

Generally, the two general categories of scientific research are quantitative and qualitative research (Ary et al., 2002; Fraenkel & Wallen, 2000). Qualitative research is to identify causes or relationships for in-depth understanding of the phenomenon of interest. Thus, qualitative research utilizes such methodology as case studies, in-depth interview, or participant observation. On the other hand, quantitative research is interested in questions of how much, or how well, or to whom does the phenomenon in concern apply (Frankel & Wallen, 2000). To do so, quantitative research makes inferences based on objective measurement and numerical analysis of data collected from respondents in order for achieve the primary goal of quantitative research – “to describe cause and effect” (Kerlinger & Lee, 2000, p. 590). Since the purpose of the current study
is to explore the roles of resources on the attainment of intercollegiate athletic goals, this study fits in quantitative research. Thus, presented in the following section is on quantitative methods.

**Quantitative Research**

In regards to quantitative research, this type of research is classified as experimental and non-experimental research (Thomas & Nelson, 1990). Experimental research consists of true experiments, quasi-experiments, and one-subject studies (Kerlinger & Lee, 2000). Generally, experimental research allows investigator to manipulate changes in treatment to people or environment to determine the effects of the treatments on the dependent variable. Experimental research has three basic elements: “(a) an independent variable is manipulated; (b) all other variables that might affect the dependent variable are held constant, and; (c) the effect of the manipulation of the independent variable on the dependent variable is observed” (Ary et al., 2002, p. 276-277). While this method is advantages to prove causation and examining theoretical models, experimental research may only be applied to issues that allow external manipulation (Fraenkel & Wallen, 2000). In contrast, non-experimental research does not attempt to manipulate the treatment because manipulations regarding phenomena of interest have already occurred or they are just not manipulable (Kerlinger & Lee, 2000). While experimental research focuses on causal relations with manipulated variables, non-experimental research looks or explores the relationship between the independent variable and the dependent variable. Due to the purpose of the current research, non-experimental design was recommended.
Non-experimental research, often referred to as descriptive research (Thomas & Nelson, 1990), include correlational, causal-comparative, and survey research (Fraenkel & Wallen, 2000). People often use the term *associational research* that includes both correlational and causal-comparative research (Ary et al., 2002). Causal-comparative research attempts to determine the cause or consequences of differences between two groups of people. Researchers in this design must select groups with known differences and should control extraneous variables that may cause the differences. This type of research is different from experimental research in that independent variable is not manipulated. However, the results of causal comparative research should be cautiously interpreted whether independent variable is the cause of the dependent variables because researchers may fail to control other variables affecting the causal relationship (Ary et al., 2002). Even though this type of research has possible problems in interpretation, causal-comparative research has been a predominant design to determine and explore possible causes of phenomenon of interest. Especially, this type of research design is often used when experimental design is not feasible (e.g., non-manipulable variables) or ethical (e.g., different treatment with a significantly unfair consequences).

Correlational research is to determine the existing relationship between two or more variables where the degree of relationship is expressed in terms of numerical index such as correlational coefficient (Thomas & Nelson, 1990). Since correlational research is used to describe the degree to which two or more variables are related, this type of research is considered as descriptive research. The most important reason for conducting correlational research is to explain human behaviors (Fraenkel & Wallen, 2000). According to Fraenkel and Wallen, “a major purpose of correlational research is to clarify
our understanding of important phenomena by identifying relationships among variables” (p. 339). In addition, correlational research is also used to predict human behavior or outcomes as long as: (a) score of both the predictor variable and the criterion variable are known; and (b) there is a significant relationship between two variables (Fraenkel & Wallen, 2000). In this design, data is often collected by means of the survey method because researcher may produce a questionnaire of correlated items with other items (Fraenkel & Wallen, 2000). While there are some similarities between casual-comparative and correlational research, there are two major distinguishable differences. First, correlational design requires a score on each variable from all respondents while causal-comparative design compares two or more groups of subjects in the research of interest. Second, correlational design is conducted to investigate two or more quantitative variables while causal-comparative design involves at least one or more categorical variable.

The last non-experimental design is survey research. This research design is probably the most employed descriptive methods in general, especially in educational and social sciences (Ary et al., 2002). Comparison to other research design including qualitative methods, this type of research is helpful to collect the large amount of data from the population. Thus, survey design is often used to obtain and summarize demographic information of the people of interest and identifies groups’ opinion regarding the phenomenon of interest (Thomas & Nelson, 1990). In this sense, survey research is different from other non-experimental research (i.e., associational designs) in that this type of research does not involve in identifying relationships between variables. For the effective survey research, investigators should consider four possible errors.
According to Dillman (2000), researchers should avoid sampling error, coverage error, measurement error, and non-response error in using survey research.

In order to conduct the current research, the investigator uses a correlational design because the relationships being investigated include correlations between profiles of resources and organizational performance. For the current study, available data (e.g., archival data) are utilized. The following section provides information of research with archival records.

**Available Data (Archival Data)**

As a source of measurement, archival records are often used in various field of research. In contrast to experiments, surveys, and field studies, another way to conducting social research is to utilize available data. Defined as existing recorded information, archival records include, but not limited to, public documents and official records, private documents, mass media, physical, nonverbal materials, and social science data archives (Singleton, & Straits, 1999).

According to Singleton and Straits (1999) and Hyman (1972), advantages of making use of available data might be (a) nonreactive measurement, (b) analyzing social structure, (c) studying and understanding the past, (d) understanding social change, (e) studying problems cross-culturally, (f) improving knowledge through replication and increased sample size, and (g) savings on research costs.

The first advantage of research using available data is the nonreactive nature of measurement where reactive measurement is one of the major problems in social research. Whereas typical research strategies in social science often confront subjects’ changes in behavior occurring during studies or observations, research with available data
have no connections between researchers and producers (publishers) of available data. Second, available data make researchers capable to analyze larger social units or social structures in that the majority of social research is of individual (e.g., individual attitudes and behaviors). Given that available data often provide information of groups and contextual (or social) networks, this research strategy may have better chances to analyze social structure. Third, available data allow researchers to investigate the past by providing relevant records. In this sense, available data are especially useful for historians. Fourth, available data may be helpful to understand social changes because available data are capable to provide enough sources of data for longitudinal studies. Fifth, archival data are good sources of cross-national/cultural research because much of available data (e.g., national censuses, ethnographies) are applicable and comparable across nations. Sixth, the use of available data provides researchers with opportunities to deal with a larger sample in comparison to experiments or field studies that use smaller samples in size. Given that the increase in sample size is associated with the increased confidence in study results (e.g., reliability) as well as the access to specialized problems and smaller populations, the use of available data may contribute to improvement in knowledge. Last, the use of available data may save research costs in terms of money, time, and personnel. While the costs associated with conducting research may depend on the nature of the research, research with available data tend to be less costly in comparison to experiments, surveys, and field studies because research with available data may require lesser efforts in searching and coding of relevant information.

It should be noted that several advantages are realized due to the research strategy employed in this study. First, it is possible that athletic directors and coaches may
provide socially desirable answers (i.e., reactive measurement). The use of available data, rather than subjective data by perceptual judgment, may enhance the objectivity of the study in that the current study only utilized objective measures of variables. Second, the use of available data increased the sample size by eliminating any chance of non-responses. The inclusion of information from the target population might increase the reliability and value of the study results. Last, the research strategy with available data would save time and costs of the research by utilizing secondary data.

As other methodologies have their own problems, available-data research also has its problem(s). Such problems may be labeled as (a) searching for and procuring available data, (b) measurement of key concepts, (c) evaluation of data quality, and (d) assessment of data completeness (Singleton & Straits, 1999).

The first possible disadvantage of available data may be about the extent to which researchers can find and procure relevant information for the purpose of the research at hand as well as, if necessary, gain a permission to use procured information. The second problem is about how perfectly available data fit with key concepts or variables of the research because data available to researchers may not be suited to the purposes of the research in mind. The third plausible problem of using available data may be about evaluation of data quality in terms of how, when, where, and by whom the data were collected. Since researchers do not participate in processes concerning original data generations, the researcher must evaluate whether available data are valid, reliable, authentic, and accurate. The last possible problem is to what extent available data completely represent characteristics of a designated sample (or population). Given the
situation that researchers have no choice but to use what is available for them, data with incomplete representations may hurt the purposes of the research.

The current study followed several guidelines suggested by Singleton and Straits (1999) to prevent the possible problems from using available data. In regard to the first problem concerning finding and procuring available data, the research questions posed in this study lead to relevant sources of available data. Given that the current study is interested in collegiate sports and higher education, the researcher looked into appropriate sources (e.g., documents, databases) provided by educational agencies (e.g., U.S. Department of Education). In addition, this study looked in related studies by previous investigators. For example, research in alumni donations (e.g., Cunningham & Cochi-Fiscano, 2002) and human resource in intercollegiate athletics (e.g., Cunningham, 2003) guided to locate such data as the Peterson’s College and University Guide and Sears’ Directors Cup Ratings.

Concerning the second problem of measuring key concepts, one may make the creative use of approximate variables or proxy indicators that provide the relevant information. For example, years since establishment of the institution were used as a proxy for the tradition of an institution. About the third issue of reliability, validity, authenticity, and accuracy, it is reasonable to say that the current study meets all the requirements. By using such sources as “Equity in Athletics” by the U.S. Department of Education, “Petersons’ College and University Guide”, and various reports by the NCAA, this study could prevent possible problems of data quality. Therefore, the fourth problem of available data (i.e., data completeness) could be avoided by using such dependable sources because all the sources of the study tend to collect information from
the whole population and, therefore, have the complete representativeness of the data. As stated, the current study paid a great attention to avoid any possible problem of available data. Thus, it concluded that the available data do represent all the variables in this study.

Population and Sample

There are about 3600 colleges and universities of various sizes and kinds in the U.S. In regard to collegiate athletics, the National Collegiate Athletic Association (NCAA) provides useful classifications based on such criteria as numbers of sports provided, and the rate of athletic scholarships offered. Among those higher education institutions, the current study is interested in 324 universities and colleges that are associated with the NCAA at the Division I level. Other NCAA member institutions are grouped in Division II and III. Based on the NCAA categorizations, Division I member institutions should sponsor fourteen sports (at least 7 for women) and at least two team sports for each gender. Division I institutions, again, can be grouped by I-A, I-AA, and I-AAA institutions based on the extent to which schools provide a football program. If a member institution does not sponsor a football program, the school is classified as I-AAA (otherwise, classified as I-A or I-AA). Depending on minimum attendance requirement by the NCAA, schools with football programs are grouped by I-A or I-AA institutions.

This study will investigate the impact of resources on organizational effectiveness at the aggregated level (e.g., all Division I institutions). Therefore, for the current study, those 324 institutions at the NCAA Division I level constituted the study population. In that all of schools in the NCAA Division I are available for inclusion, the target and accessible populations are identical (Ary et al., 2002).
Sample Size

In order to minimize statistical problems and obtain better results, researchers must attempt to produce larger sample size. However, obtaining large sample is difficult because researchers confront such problems as financial and temporal constraints (Dillman, 2000). Therefore, it has been suggested that obtaining a representative sample is more critical than generating a large sample. Several considerations must be exerted for selection of the sample size. According to Dillman (2000), sample size should be decided based on; (a) tolerance for sampling error, (b) the population size from which the sample is drawn, c) the homogeneity of the population, and (d) the confidence level chosen. The increase of the sample size can decrease the sampling error because there will be less variation about the mean from one random sample to another (Ary et al., 2002). As the population size increases, more responses will be needed to make the inferences while fewer responses will be needed for smaller population. In addition, more homogeneous populations require smaller sample size while heterogeneous populations require larger sample size. The reason is that the responses from heterogeneous population are less likely to reflect the true population mean because this population is suspected to produce more varied samples. On the other hand, responses from homogeneous population are more likely reflect the true population means (Ary et al., 2002). In addition, larger sample size is required as investigators set higher confident level.

Among several considerations for selecting the sample size, one critical consideration is to have power in the statistical analyses. According to Kerlinger and Lee (2000), power is the “fractional value between 0 and 1 that is defined as 1 – β, where β is
the probability of committing a Type II error” (p. 453). It is used to know the probability
of failing to reject a false null hypothesis. In other words, \( \beta \) is to examine the chances of
not detecting an effect when an effect exists (Hair, Anderson, Tatham, & Black, 1998).
Thus, the power is critical to detect statistically significant differences in the analysis
(Thomas & Nelson, 1990). In the case that the power is too sensitive, any effect size can
be detected even though the effect detected has no practical meaning. On the other hand,
meaningful effects many not be detected if the power level is low and insufficient. When
researchers determine a power level, they should be aware of the relationship between
power and sample size. Researchers with extremely small samples may be unable to
conduct both the statistical analysis and the tests for power while researchers with very
large samples may have extremely sensitive power levels that may cause possible
interpretational problems (Hair et al., 1998). Having a larger sample may be better for
further statistical analysis as long as the size of samples is not too big. However,
researchers should consider other problems from administrations and restrictions. In
considering this issue, there are several methods for deciding the sample size required for
having the sufficient power where the needed power is suggested .80 when researchers
have no specific criteria (Cohen, 1977). Hair et al. (1998) suggest rules to calculate a
sample size for (multiple) regression analysis. In their formula, the number of
independent variables is one of criteria for deciding the size of samples. They
recommended at least five observations for each independent variable while they suggest
fifteen to twenty responses per an independent variable to be desirable. According to
Hair et al.’s (1998) first suggestion, a study should have at least 75 observations and
desirably about 300 observations in case that a study has 15 independent variables. Since
there are 324 observations, which are not flexible, in this study, the researcher should be aware of the numbers of indicators to be used in the present study.

In addition to independent variables, the significant level of the tests (e.g., \( \alpha = .05 \)) should be considered for choosing a sample size. Hair et al. (1998) provided a table for detecting effect sizes (\( R^2 \)) based on the level of statistical significance, sample sizes, and power. In the current study, there are fifteen independent variables in the statistical analysis. The table provided by Hair et al. (1998) indicates that a sample of around 100 in a study with ten independent variables is needed to detect a minimum \( R^2 \) of .18 with a power of .80 while that of 300 is required to detect a minimum \( R^2 \) of .07. Given that this study is consistent with suggestions by Hair et al. (1998) and the size of the sample is limited, the sample size of about 300 is needed and acceptable.

Along with the consideration of sample size in regression analysis, the use of structural equation modeling also requires deep considerations because the sample size influences the model estimation and interpretation. In regard to the sample size, the following four factors are critical. Those are (a) model misspecification (i.e., omission of relevant variable from the specified model), (b) model size (e.g., a minimum ratio of at least five observations per parameter), (c) departure from normality (i.e., nonnormal data should provide sufficient sample size), and (d) estimation procedure (the use of Maximum likelihood estimation requires a minimum sample size of 100) (Hair et al., 1998). According to Hair et al. (1998), it is recommended to have a sample size of 200 or more in consideration of above four factors. In addition, they recommended that the ratio of observations to the number of model parameters should be at least 5. Since the sample size of the current study is more than 300, this study satisfies one of Hair et al.’s
recommendations. Yet, with the original proposed model, the present study could not satisfy the recommendation of a minimum ratio of at least five respondents for each estimated parameter. Thus, a model simplification was strongly indicated.

Model Simplification

The next thing we had to consider is the number of indicators to be utilized in the current study. The original conceptualization of the proposed model included a large number of indicators for each construct (see Figure 1.1 on page 12). The researcher confronted conceptual as well as empirical challenges concerning numbers of indicators to be used in this study. In terms of conceptual issues, some indicators might not represent what they were supposed to measure while some of indicators seemed to be linearly dependent on each other.

One empirical constraint was that the sample size of the study could not be increased because of the limited size of population (i.e., NCAA Division I members). For SEM, Hair et al. (1998) suggested that 10 observations per parameter are desirable. Since the proposed model was complex, the researcher decided to reduce the number of indicators to satisfy the sample size requirement (e.g., more observations per parameter estimated) as suggested by Hair et al. (1998).

The original model of 6 latent variables with total 24 indicators suggested that there would be, at least, 53 parameters to be estimated, which indicated that a sample size of 530 or more was required. However, the sample size of the current study was limited to 324 due to the population size.

In regard to conceptualization of each indicator, a re-examination of the relevance of indicators was encouraged in that the current study utilized the available proxies as
indicators of the study. As Singleton and Straits (1999) stated, ‘measurement of key concepts’ is one of problematic issues in available-data research. In this regard, ‘population of city’ where a university is located was the first variable (indicator) reconsidered. While the size of city population can be a reasonable variable influencing intercollegiate athletics (e.g., easy access to college games, diverse sports enterprises as competitors), the size of population by itself does not represent what this study wanted to measure because the information of city population does not include ‘the population of adjacent cities’ and ‘distances and accessibilities to the metropolitan areas’. For example, the city population of Ann Arbor, MI, is 114,024, yet this number does not include numbers of people live in the nearby metropolitan city of Detroit, MI. On the other hand, the size of the city population in Jackson, MS, is 184,256 which is bigger than that of Ann Arbor, MI, yet there is no metro-city around the city of Jackson, MS. As such, ‘the city population’ as a proxy or an indicator in the current study was not considered meaningful and, thus, excluded from the study. In addition, the data associated with this variable was non-normal.

The next concern was about the linear dependency of variables. In the study of Cunningham and his associate (Cunningham, 2003; Cunningham & Sagas, in press) they used Recruiting Expenses and Average Coaches’ Salary as the indicators of the quality of student-athletes and coaches for each athletic department (i.e., the quality of human resources). In the present model, these variables would be indicators of Financial/Physical Resources. Thus, if Sport and Administrative Expenses are used as indicators of Financial Resources, Recruiting Expenses and Coaches Salary cannot be used as indicators of Human Resources because those indicators would end up measuring
same constructs. Similarly, *Athletically-Related Student Aids* is part of each athletic department’s *Sport Expenses*. Therefore, an inclusion of *Athletically-Related Student Aids* as an indicator of Financial Further, the Number of Sport Programs is conceptually dependent upon the numbers of coaches and student-athletes, or vice versa. These cases of measuring constructs with linearly dependent indicators lead to issues of multicollinearity and not-positive-definite correlation and/or correlation matrix which are problematic SEM (Hair et al., 1998). The best way to avoid such problems is to eliminate the offending variables.

Indicators of intangible resources (i.e., organizational resources) also showed the similar issues. Peterson’s College and University Guide which annually classifies American universities implicitly employs school types, enrollment, faculty size, and endowment as criteria in its rankings. Accordingly, these four factors were excluded as indicators of *Organizational Resources*.

Likewise, there seemed to be a linear dependency of *Sears Cup scores* (i.e., winning) with monetary surplus, fan attendance, and numbers of all Americans. To avoid such problems as not-positive-definite correlation, only the indicator of *Sears Cup scores* was selected.

After the elimination of problematic variables, *Human Resources* were measured by *Numbers of Coaches* and *Numbers of Student-Athletes* while *Financial/Physical Resources* were represented by *Sport Expenses* and *Administrative Expenses*. Intangible Resources were measured by *Academic Reputation* and *History* (i.e., Academic Resources) as well as *Athletic Reputation*. In addition, three outcome measures were included in the final process (i.e., Sears Cup scores for performance goals, Graduation
Rate and Gender Equity of participants for developmental goals). By eliminating redundant indicators (variables), the current study has avoided conceptual as well as empirical issues concerning indicators.

Study Variables

**Independent Variables**

*Organizational Resources (Intangible Resources)*. The term “organizational resources” refers to organizational culture, history, relationships, and trust, as well as the formal and informal organizational structure concerning planning, reporting, controlling, and coordinating systems (Barney, 1991, 1995). In the current study, organizational resources were operationalized by: (a) athletic reputation, (b) academic reputation, and (c) tradition. All the data to be used in the study were ‘secondary (available) data’.

*Physical/Financial Resources*. An organization’s physical resources consist of, but not limited to, plants and equipments, facilities, and buildings (Barney, 1991; Williamson, 1975) whereas financial resources refer to monetary related resources such as retained earnings (Barney, 1991). In this study, this resource was operationalized by (a) sports expenses, and (b) administrative expenses.

*Human Resources*. Barney (1991) suggests that human resources include the training, experience, judgment, intelligence, relationships, and insight of the workforce in the organization. In this study, human resources in athletic departments were operationalized by (a) numbers of coaches, and (b) numbers of athletes.

**Dependent Variables**

*Intercollegiate Athletic Goals*. In the organizational contexts, goals are defined as the things that “depict a future state of affairs, guide organizational activity, and provide a
source of legitimacy for an organization’s existence” (Etzioni, 1964, p. 5). In the context of intercollegiate athletics, it has been suggested that there are two competing goals (i.e., performance and developmental goals). Thus, the current study borrowed the concepts of Trail and Chelladurai’s (2000) intercollegiate athletic goals in which developmental goals are represented by student-athlete academic achievement, student-athlete health/fitness, student-athlete social/moral citizenship, organizational culture of diversity, and student-athlete careers whereas performance goals consist of university visibility and prestige, financial security, winning, entertainment, and national sport development. In this study, developmental goals were operationalized by (a) graduation rate, and (b) gender equity in terms of number of athletes. In addition, performance goals were operationalized by Sears Cup scores. Again, Available data were recoded for the purpose of the study.

Data Collection Procedures

The necessary data of 324 institutions for the current study were obtained from several archival records. The main data regarding athletic aspects of information were drawn from Equity in Athletics surveys for 2003 (U.S. Department of Education, 2004) as well as from the NCAA on-line database and published sources. In addition, data regarding institution-related information were obtained from such on-line databases as Peterson’s Guide to Colleges and Universities and Sperling’s Best Places for other variables in the study.

Data Analysis

The purpose of this section is to describe procedures and criteria concerning data analysis. In sum, the data analysis is composed of two steps – initial analysis (e.g., descriptive statistics) and main analysis (e.g., confirmatory factor analysis). Since the
current study employs SEM, data should meet certain criteria that satisfy the assumptions of SEM. The assumptions of normality, reliability, and multicollinearity concerning data preparation are also addressed in this session. In regard to SEM, this study utilized a “two-step” process of SEM in order to accomplish accurate representation of the reliability of the indicators (Anderson, & Gerbing, 1988). The measurement model is estimated at the first step and then fixed at the second step while the structural model is estimated in the second stage (Hair et al., 1998).

The initial data analysis reports the basic data characteristics as well as assesses the normality of data. These initial data analysis includes descriptive statistics in terms of mean, standard deviation, and distribution frequency as well as the normality values (i.e., skewness, and kurtosis).

Likewise other multivariate methods, SEM also assumes the normal distributional characteristics of the data in its estimation procedures (Kline, 1998). In this regard, the value of skewness and kurtosis are two common indexes. Skewness measures the extent to which data are symmetrically distributed while kurtosis refers to what extent a distribution of data is flat or peaked. As a general rule of thumb, it is suggested that values of skewness and kurtosis falling within the range of −1 to +1 indicate a non-skewness and normal kurtosis. In regard to SEM, Kline suggested that a variable with an absolute value of skewness bigger than 3 and that of kurtosis greater than 10 can be problematic.

Reliability refers to a measure of the internal consistency of the construct indicators (Hair et al., 1998). In SEM, the reliability of the indicators is critical because indicators measure the latent constructs that are unobservable. Reliability of each latent
variable was examined by using Cronbach’s alpha. This study set a threshold value for acceptable reliability at .70 (Nunnally, 1978). In addition to Cronbach’s alpha, the “variance extracted measure” from a latent construct was employed in this study because this measure is a complementary measure to the construct validity value (Hair et al., 1998). This measure concerns the amount of variance in the indicators accounted for by the latent variable. Thus, in the case that latent variables are clearly represented by the indicators, the amount of variance extracted should be substantial. In this study, the critical value of this measure is set at .50 and higher.

Validity is concerning “the extent to which the indicators [accurately] measure what they are supposed to measure” (Hair et al., 1998, p. 612). In this regard, construct-related validity is the broadest among other validity criteria and is especially useful when content and criterion validity measures are not available (Bollen, 1989). Construct validity concerns to the degree to which the indicators truly measure the proposed constructs in the study. Since the current study utilized a SEM, the relationships between indicators and latent variables (i.e., constructs) were measured in a CFA process. Thus, the construct validity of the concepts will be examined in terms of the factor loadings.

Along with reliability, one of the potential problems in data preparation might be an issue concerning multicollinearity that refers the extent to which “any variable’s effect can be predicted or accounted for by the other variables in the analysis” (Hair et al., 1998, p. 24). The existence of multicollinearity can be problems for SEM and regression analysis because the predictive ability of any variables’ effect is decreased as the value of multicollinearity goes up. In mathematical terms, higher multicollinearity can make some denominators to be close to zero and a sample covariance matrix to be non-positive.
(Kline, 1998). In this study, the possible multicollinearity among first-level latent variables (i.e., organizational-, physical-, and human resources) was assessed.

As mentioned earlier, the current study utilized a SEM in order to conduct first order confirmatory factor analyses and the full model testing. SEM has been one of the most useful multivariate analysis techniques because it is capable of estimating multiple equations simultaneously and measuring latent variables as well as taking measurement error account into the estimation process (Hair et al., 1998).

CFA was employed to examine the constructs related to collegiate athletic resources by using AMOS. The current study adapted a two-step procedure concerning assessing a hypothesized model in which measurement model is estimated at the first step and then fixed at the second step while the structural model is estimated in the second stage (Hair et al., 1998). In each step, the adequacy of the parameter estimates was assessed (i.e., offending estimates), followed by assessing the model as a whole (i.e., overall model fit).

In regard to offending estimates, researchers should concern about the feasibility of the parameter estimations, the appropriateness of the standard errors, and the statistical significance of the parameter estimates. As for the feasibility of the parameter estimates, any unreasonable parameter estimate is associated with correlations bigger than 1.00, negative variances, and non-positively definite covariance matrices (Byrne, 2001). In regard to the standard error, the excessive value of standard error (i.e., either too big or too small) may lead to poor model fit even though there is no established criterion of such value (Joreskog & Sorbom, 1989). In addition, statistical significance of the parameter estimates should be assessed by means of the critical ratio (CR). Since CR represents the
parameter estimates divided by its standard error, the calculated values should be greater than ±1.96 at the alpha level of .05.

For each step, the model fit were assessed in terms of several fit indices where overall model fit (i.e., goodness-of-fit) is defined as the extent to which the hypothesized constructs are represented by the indicators of the study (Hair et al., 1998). For goodness-of-fit measures, three types of measures are commonly used. Those are (a) absolute fit measures (i.e., the overall model fit with no adjustment for the degree of overfitting), (b) incremental fit measures (i.e., differences between the proposed model to another model), and (c) parsimonious fit measures (i.e., adjusted measures of fit with different numbers of estimated coefficients). Unfortunately, there is no rule of thumb in choosing such measures. Rather, it is recommended that researchers should employ one or more measures from each type of fit measures. By utilizing multiple measures, it is expected to gain a consensus concerning the acceptability of the model (Hair et al., 1998). Therefore, the current study utilized multiple measures from three types of fit measures stated above.

As for absolute fit measures, the current study will utilize three common indices that are (a) the likelihood ratio of Chi-square to the degrees of freedom ($\chi^2$/ df), (b) the root mean square error of approximation (RMSEA), and (c) the goodness-of-fit index (GFI). Given that a large value of Chi-square is associated with a poor fit of the model to the data, the proposed model should have a small value of Chi-square to the degrees of freedom (e.g., values under 5). In addition, the GFI will be used to assess the overall degree of fit. In terms of the GFI, a small value (i.e., a value close to .00) indicates a poor fit while a large value (i.e., close to 1.00) represents a perfect fit. However, one of
the drawbacks using the Chi-square value is that this measure tends to be less reliable with a sample size of 200 or more. In this regard, the RMSEA can be a complementary measure in that the RMSEA refers to the discrepancy per degree of freedom (Hair et al., 1998). The acceptable range of the RMSEA values is from .05 to .08.

In addition to the use of absolute fit indices, researchers should use incremental fit measures and parsimonious fit measures in that absolute fit measures by themselves cannot ensure acceptability of the model. Of incremental and parsimonious fit measures, this study will use the normed fit index (NFI) as well as the comparative fit index (CFI). Given that the proposed model is compared to a basic model (i.e., a null model) in incremental fit measures, the value of the NFI represents a relative comparison of two models (i.e., a NFI value of .00 representing a poor fit while 1.00 indicating a perfect fit). For the purpose of the current study, the acceptable value of the NFI will be set at .90 or greater. As with the NFI, the CFI will be utilized to assess the model fit because the CFI is especially helpful for a model development strategy (Rigdon, 1996).
CHAPTER 4

RESULTS

This chapter provides results of the data analysis procedures conducted for this study. This chapter explains results of statistical analysis in the study.

Descriptive Analysis

Sample Characteristics

The data were collected from various archival databases. Contents of data included institutional characteristics as well as athletics-related information. The total number of organizations were 326 NCAA Division I member institutions. Of 326 subjects, 2 institutions were excluded from the data analysis because there was no record available for these two institutions. Thus, the size of the final pool was 324 institutions comprised of 121 Division I-A (37.3%), 118 Division I-AA (36.4%), and 85 Division I-AAA institutions (26.2%).

In terms of institutional characteristics (see Table 4.1), the majority were public (i.e., state-supported) institutions (N=218, 67.3%) and the rest of them were private (N=106, 32.7%). The average years since established was 120.1 years, ranging from 32 to 367 years (S.D. =49.7). The average student enrolment was 15,713, varying from 1,038 to 51,223. In addition, the institutions’ mean student-faculty ratio was 16.3:1
(S.D.=3.98) and the median endowment was $84.35 million, ranging from $1 million to $18.3 billion. Of 324 institutions, 39.5% were located in urban areas (N=128), 33.6% were set in suburban areas (N=109), and 23.8% were in small towns (N=77). In addition, 10 institutions were located in rural areas (3.1%). Academic reputation of each school was operationalized in terms of overall entrance difficulty suggested by the Peterson’s College Guide. Based on this guideline, 18 institutions were identified as most difficult institutions (5.6%), followed by 42 very difficult (13.0%), 226 moderately difficult (69.8%), 25 minimally difficult (7.7%), and 13 non-competitive institutions (4.0%).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>Range (min. – max.)</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.33</td>
<td>.47</td>
<td></td>
<td></td>
<td>1: Public = 218</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2: Private= 106</td>
</tr>
<tr>
<td>History</td>
<td>120.00</td>
<td>49.71</td>
<td>32 –</td>
<td>367</td>
<td></td>
</tr>
<tr>
<td>Enrollment</td>
<td>15,713.00</td>
<td>10,908.67</td>
<td>1,038-</td>
<td>51,223</td>
<td></td>
</tr>
<tr>
<td>Faculty Ratio</td>
<td>16.25:1</td>
<td>4.03</td>
<td>5:1  –</td>
<td>30:1</td>
<td></td>
</tr>
<tr>
<td>Endowment</td>
<td>$84.35 mill.</td>
<td>$1,535.26 mill.</td>
<td>$1 mill. - $18.3 bill.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academics Reputation</td>
<td>3.10</td>
<td>.77</td>
<td></td>
<td></td>
<td>1: Non-competitive = 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2: Minimally Competitive = 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3: Moderately Difficult = 227</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4: Very Difficult = 43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5: Most Difficult = 19</td>
</tr>
</tbody>
</table>

Table 4.1: Institutional Characteristics
In terms of athletics-related information (see Table 4.2), the average number of NCAA championship in all types of sports were 4.37 (S.D.=11.41), ranging from 0 to 91 titles. Yet, the majority of NCAA institutions have never won any NCAA Division I level championship (N=185, 57.1%). On an average, each athletic department has approximately 254 male (S.D.=113.45) and 203 female student-athletes (S.D.=95.45) for a total of 457 student-athletes (S.D.=199.09). The largest reported size of participants was 815 for male student-athletes and 639 for female student-athletes. To control the influence of athletic departments’ size, the number of participants was divided by the number of sports provided by each institution which yielded an index of 28.51 (S.D.=7.67). On an average, each athletic department offered 7.41 men’s sports (S.D.=2.24) and 8.40 women’s sports (S.D.=2.23), and 15.81 sports (S.D.=4.23) overall. In this study, the number of sports offered was retrieved from the U.S. Department of Education. Since some institutions reported indoor and outdoor track and field, and cross country as one sport, the number of sports offered was somewhat smaller. In regard to athletics-related student aids, the average expenditure was $1,632,919 for male participants (S.D.=1,156,963) and $1,328,845 for female participants (S.D.=874,285), and $2,961,764 in total. In terms of operating expenses, the median expenditure was $1,094,337 for men’s sports (S.D.=1,177,772) and $612,914 for women’s sports (S.D.=461,409), and $1,707,251 in total.

The mean of the total head coaches was 7.68 for men’s sports (S.D.=2.60) and 8.68 for women’s sports (S.D.=2.55), totaling up 16.34 head coaches. Numbers of assistant coaches were 19.88 for men’s sports (S.D.=8.45) and 15.10 for women’s sports (S.D.=7.00). In sum, each athletic department had on an average 51.34 coaches.
(S.D.=18.52) and, thus, 3.23 coaches per sport (S.D.=7.08). Since some institutions combined indoor, outdoor, and cross-country as one group of sport, the actual number of coaches per sport might be smaller than 3.23. As for coaches’ salary per Full-Time Equivalency (hereafter, FTE), the median salary for head coaches in men’s sports was $82,293 per FTE (S.D.=173,301) and that of head coaches in women’s sports was $53,906 per FTE (S.D.=91,245). In median terms, assistant coaches in men’s sports received $44,400 per FTE (S.D.=143,551) while those in women’s sports received $32,150 (S.D.=71,513).

In regard to revenues and expenses, each athletic department reported the median revenue of $8,098,555 (S.D.=15,240,082) and average expense of $8,258,802 (S.D.=12,462,433). The range of revenues was from $317,430 to $87,748,049 while that of expenses was from $808,309 to $67,126,751. In detail, total revenue consists of ‘revenues attributable to sports’ and ‘revenues not allocated to sports’. By the same token, total expense is comprised of ‘expenses attributable to sports’ and ‘expenses not allocated by sports’. Each athletic department reported $4,820,903 and $2,951,423 as ‘the median revenues attributable to sports’ and ‘the median revenues not allocated by sports’, respectively. In addition, they reported $6,073,466 and $2,233,007 as ‘the median expenses attributable to sports’ and ‘the median expenses not allocated by sports’, respectively.

As for student-athletes’ graduation rate, the mean graduation rate of four-class average was 58.74% (S.D.=13.14) and that of 1996-997 freshmen cohort was 61.07% (S.D.=14.22). The range of four-class graduation rate was from 27% to 91% and that of 96-97 freshmen cohort was from 15% to 100%. The mean number of major sanctions
and probation during the period of 1992 to 2004 was \(0.38\) (S.D.=0.65). Only 98 athletic departments (30.2%) were involved in major infractions. In detail, 3 athletic departments (.9%) committed 3 major infractions, 20 athletic departments (6.2%) involved in 2 major infractions, and 75 athletic departments (23.1%) committed 1 major infraction. One additional measure included in this study was Sears’ Directors Cup score. The mean score was 176.34 (S.D.=238.93), ranging from 0 to 1421 points. Of 324 athletic departments, 60 athletic departments (18.5%) failed to earn any point.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>Range (min. – max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletic Championship</td>
<td>4.37</td>
<td>0.00</td>
<td>11.41</td>
<td>0 – 91</td>
</tr>
<tr>
<td>Sports Expenses</td>
<td>$9,310,897</td>
<td>$6,073,466</td>
<td>$7,637,198</td>
<td>$532,788 - $40,097,544</td>
</tr>
<tr>
<td>Administrative Expenses</td>
<td>$4,442,018</td>
<td>$2,233,007</td>
<td>$5,657,486</td>
<td>$0 – $29,365,846</td>
</tr>
<tr>
<td># of Coaches</td>
<td>51.34</td>
<td>48.00</td>
<td>18.52</td>
<td>17 – 124</td>
</tr>
<tr>
<td># of Students-Athletes</td>
<td>457.39</td>
<td>421.00</td>
<td>199.09</td>
<td>138 – 1,454</td>
</tr>
<tr>
<td>Sears Cup Point</td>
<td>176.71</td>
<td>82.75</td>
<td>238.67</td>
<td>0 – 1,420.5</td>
</tr>
<tr>
<td>Graduation Rate</td>
<td>64.00%</td>
<td>58.74%</td>
<td>13.12</td>
<td>27 – 91</td>
</tr>
<tr>
<td>% of Female Participants</td>
<td>44.17%</td>
<td>44.67%</td>
<td>7.15</td>
<td>9.39 – 66.59%</td>
</tr>
</tbody>
</table>

Table 4.2: Athletic Department Information
Normality

Next, univariate skewness and kurtosis statistics were calculated to examine normality of the data (see Table 4.3). The reported values of skewness and kurtosis would indicate if there were normality and outlier problems that may influence the covariance matrix and the results in structural equation modeling. According to Schumacker and Lomax (1996), there are five possible reasons for an observation of outliers: (a) a recording or data entry error, (b) an error in observation, (c) an improper function of an instrument, (d) improper administration of an instrument, and (e) an existence of a true outlier (p. 5). In regard to recording or observation error, the researcher re-checked any error in data entry processes and found no error. In addition, improper functions and administration of an instrument were not relevant issues for this study because it utilized the available data. This left us only one reason for issues in non-normality that is an existence of a true outlier (or outliers). In fact, several subjects could be considered as outliers in some aspects. For example, four athletic departments earned more than 1,000 Sears Directors’ Cup points in 2003 while 60 out of 324 athletic departments did not earn a single point as well as the mean score was about 176 points. Such outliers in the data were accurate observations and might contain important information. Thus, these outliers should be included for the further analysis (Schumacker & Lomax, 1996). There are several remedies for nonnormal data. One common solution is to transform data by using several mathematical techniques (e.g., log X, Square Root X, 1/X). This study utilized a square root transformation technique to normalize the data. There is no clear rule of thumb concerning a problematic level of non-normality. Yet, SEM studies have suggested that data with absolute values of skewness bigger than 3 and those of kurtosis
greater than 10 can be problematic (Kline, 1998). After the data transformation, there was no variable with problematic values for kurtosis and skewness. All the absolute value of skewness were smaller than 2.04 and those of kurtosis were smaller than 4.706. These values indicated that non-normality of the data was not an issue (Kline, 1998). In addition, all the data were standardized for the comparability in the interpretation phase as well as for preventing possible inflations of error variances in structural equation modeling.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ath1 (Athletic Reputation)</td>
<td>2.040</td>
<td>4.706</td>
</tr>
<tr>
<td>Acr1 (Academic Reputation)</td>
<td>.067</td>
<td>2.070</td>
</tr>
<tr>
<td>Acr2 (History)</td>
<td>.911</td>
<td>2.532</td>
</tr>
<tr>
<td>Hr1 (# of Coaches)</td>
<td>.537</td>
<td>.601</td>
</tr>
<tr>
<td>Hr2 (# of Student-Athletes)</td>
<td>.740</td>
<td>.738</td>
</tr>
<tr>
<td>Fin1 (Sport Expenses)</td>
<td>.971</td>
<td>.259</td>
</tr>
<tr>
<td>Fin2 (Admin Expenses)</td>
<td>.999</td>
<td>.614</td>
</tr>
<tr>
<td>Dg1 (Graduation Rate)</td>
<td>.109</td>
<td>-.312</td>
</tr>
<tr>
<td>Dg2 (Gender Equity)</td>
<td>-.592</td>
<td>1.992</td>
</tr>
<tr>
<td>Pg1 (Sears Cup Score)</td>
<td>.762</td>
<td>.158</td>
</tr>
</tbody>
</table>

Table 4.3: Skewness and Kurtosis Indices of the Data
Multicollinearity

In addition to normality of the data, the existence of multicollinearity can be problematic in SEM because it might cause a sample covariance matrix to be non-positive definite (Kline, 1998). The occurrence of multicollinearity is due to high intercorrelations among some variables that make some mathematical operations inoperable or unstable (Kline, 1998). The possible problem of multicollinearity can be examined with bivariate correlations which suggest possible redundant variables or high intercorrelations. In this regard, there are several guidelines about problematic level of intercorrelations. For example, Kline (1998) suggested that a bivariate correlation value of .85 or higher might indicate that there is a multicollinearity problem. Similarly, Rockwell (1975) recommended that researchers should consider relationships between variables if a value of bivariate correlation exceeds .80. To examine such multicollinearity, the correlations among the summated means of each latent variables and single-item indicators were computed (see Table 4.4). According to the table, the range of bivariate correlations was from .050 to .799 indicating no problematic interdependence among variables.

Reliability

Reliability is concerning “the degree of consistency with which it measures whatever it is measuring” (Ary et al., 2002, p. 249). Reliability in SEM is defined as “a measure of the internal consistency of the construct indicators, depicting the degree to which they indicate the common latent construct” (Hair et al., 1998, p. 612).

In SEM (especially in the measurement model), the most critical measure of reliability is ‘composite reliability’ of each construct (i.e., latent variables) because it
<table>
<thead>
<tr>
<th></th>
<th>ATR</th>
<th>ACR</th>
<th>Fin</th>
<th>HR</th>
<th>Sears</th>
<th>GR</th>
<th>GE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletic Reputation (ATR)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Resource (ACR)</td>
<td>.435**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Resources (Fin)</td>
<td>.681**</td>
<td>.396**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Resources (HR)</td>
<td>.595**</td>
<td>.602**</td>
<td>.668**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sears’ Cup Score (Sears)</td>
<td>.730**</td>
<td>.429**</td>
<td>.799**</td>
<td>.644**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education - Grad Rate (Grad)</td>
<td>.130*</td>
<td>.499**</td>
<td>.177**</td>
<td>.341**</td>
<td>.181**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Gender Equity (Equity)</td>
<td>.089</td>
<td>.068</td>
<td>.089</td>
<td>.050</td>
<td>.124*</td>
<td>.177**</td>
<td>1</td>
</tr>
</tbody>
</table>

** $p < .01$ (2-tailed).
* $p < .05$ (2-tailed).

Table 4.4: Correlation Matrix of Latent and Single-Indicator Variables
indicates the extent to which each indicator consistently measure each latent variable. The value of .5 or greater indicates that a construct is reliable (Hair et al., 1998). The composite reliabilities for three constructs were calculated (see Table 4.5). All three values of construct validity were higher than .5 ensuring latent variables’ unidimensionality (Hair et al., 1998).

In addition, the current study utilized several single-item measurements (e.g., athletic reputation) with which an empirical assessment of reliability is impossible. Given the high quality of data collection, this study assumed the fair reliability of the data (e.g., small measurement error).

<table>
<thead>
<tr>
<th>Construct</th>
<th>Construct Reliability</th>
<th>Variance Extracted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Resources (ACR)</td>
<td>.563</td>
<td>.392</td>
</tr>
<tr>
<td>Financial Resources (Fin)</td>
<td>.855</td>
<td>.749</td>
</tr>
<tr>
<td>Human Resources (HR)</td>
<td>.928</td>
<td>.865</td>
</tr>
</tbody>
</table>

Table 4.5: Reliability of Latent Variables
Measurement Model

The common purposes of structural equation modeling are (a) confirmatory factor analysis (CFA) and (b) the estimation of structural equations. The current study utilized both in a two-step approach in which measurement models were evaluated first in order to prevent possible misspecifications of structural model associated with measurement model misspecifications (Burt, 1976; Hair et al., 1998). CFA in SEM allows researchers “to control over the specification of indicators for each construct” as well as to test the goodness-of-fit for the confirmatory factor solution (Hair et al., 1998, p. 616). Given these reasons, CFA is often used to validate the instruments or scales. Basically, CFA in measurement models, is concerned with exploring patterns of latent variables which are represented by variables (Hair et al., 1998).

The measurement model proposed in this study was evaluated with AMOS 4.0 program. There are two steps in evaluating a measurement model. First, researchers should inspect “offending estimates” (i.e., the adequacy of the parameter estimates) by examining whether the model exceed acceptable limits (Hair et al., 1998). In this regard, there are several common problematic examples: (a) negative error variance, (b) standardized coefficients exceeding 1.0, and (c) standardized errors close to 1.0 (Hair et al., 1998). In addition, correlation or covariance matrices that are not positive definite can also be a problem (Byrne, 2001). After inspecting offending estimates, statistical significance of the indicator loadings (i.e., parameter estimates) should be evaluated in terms of the critical ratio (C.R.). When \( t \) values of all parameters exceed the critical value of 1.96 (at .05 significance level), they ensure the hypothesized relationships among indicators and constructs (Hair et al., 1998).
The second step in evaluating a measurement model is to examine the overall model fit with goodness-of-fit measures. Since the sample size of the current study was larger than 200, the likelihood ratio of chi-square to degree of freedom ($\chi^2$/df) was used to assess the model fit because the chi-square value itself is sensitive to the sample size. In terms of absolute fit measures, goodness-of-fit index (GFI) and root mean square error of approximation (RMSEA) were used. In addition, normed fit index (NFI) for incremental fit measures and comparative fit index (CFI) for parsimonious fit measures were utilized to examine the model as a whole. In terms of the GFI, NFI, and CFI, a small value (i.e., a value close to .00) indicates a poor fit while a large value (i.e., close to 1.00) represents a perfect fit. For the purpose of the current study, the acceptable value of the GFI, NFI, and CFI were set at .90 or greater. In addition, the acceptable range of the RMSEA values is from .05 to .08.

For the measurement model, three latent variables with each of two indicators were included. Based on the RBV literature, the researcher could identify several types of resources that are relevant to the context of intercollegiate athletics. For the latent variable of Academic Resources (ACR), indicators of Academic Reputation (Acr1), and Years since Establishment (Acr2) were included. The latent variable of Human Resources was operationalized by Numbers of Coaches (HR1) and Numbers of Student-Athletes (HR2). In addition, Financial Resources (Fin) was indicated by Sports Expenses (Fin1) and Administrative Expenses (Fin2) (see Figure 4.1).
Notes 1. $\chi^2/df = 2.912$; RMSEA = .077; GFI = .983; NFI = .984; GFI = .990
Note 2. Parameters shown are standardized estimates

Figure 4.1: Confirmatory Factor Analysis Representation of the Measurement Model
As such, the total number of indicators in the measurement model was six manifested variables and three first-order latent variables. For the purpose of assessing the measurement model, each first-order latent variable was inter-correlated while none of error terms was uncorrelated. Thus, the model had 21 distinct sample moments and 15 distinct parameters to be estimated. As a result, the degree of freedom was 6, which indicates the model is overidentified.

None of correlation exceeded a value of 1.0 (see Table 4.6) and none of correlation and covariance values was positive definite. The value of correlations between latent variables ranged from .584 to .827. All values of critical ratio (C.R.) were higher than 1.96 (i.e., ranging from 6.537 to 10.134) which indicates that all the covariance between three factors were statistically significant.

<table>
<thead>
<tr>
<th>Covariance</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fin ↔ HR</td>
<td>0.678</td>
<td>0.067</td>
<td>10.134</td>
<td>0.756</td>
</tr>
<tr>
<td>HR ↔ ACR</td>
<td>0.517</td>
<td>0.062</td>
<td>8.325</td>
<td>0.827</td>
</tr>
<tr>
<td>Fin ↔ ACR</td>
<td>0.363</td>
<td>0.056</td>
<td>6.537</td>
<td>0.584</td>
</tr>
</tbody>
</table>

Table 4.6: Covariance and Correlation of Latent Variables in the Measurement Model
In addition, none of variances were negative. The critical ratio of parameter estimates ranged from 2.316 to 11.102 (i.e., > 1.96), which indicates that all the parameter estimates were statistically significant at .05 level (see Table 4.7).

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fin1</td>
<td>0.103</td>
<td>0.045</td>
<td>2.316</td>
</tr>
<tr>
<td>Fin2</td>
<td>0.405</td>
<td>0.043</td>
<td>9.389</td>
</tr>
<tr>
<td>HR1</td>
<td>0.095</td>
<td>0.024</td>
<td>4.019</td>
</tr>
<tr>
<td>HR2</td>
<td>0.176</td>
<td>0.025</td>
<td>7.140</td>
</tr>
<tr>
<td>Acr1</td>
<td>0.564</td>
<td>0.066</td>
<td>8.485</td>
</tr>
<tr>
<td>Acr2</td>
<td>0.649</td>
<td>0.065</td>
<td>10.028</td>
</tr>
</tbody>
</table>

Table 4.7: Variances of Indicators in the Measurement Model

One additional aspect of concern in examining the measurement model is looking at the values of error variances in relation to standardized loadings (i.e., standardized regression weights). A parameter estimate with an error variance of .50 or greater may be problematic and should be reevaluated by assessing its standard loading. In this study, there were two items with error variances higher than .50. Those were Acr1 (.564) and Acr2 (.649). However, their standardized loadings were .659 for Acr1 and .591 for Acr2 which were higher than the cut-off of .52 suggested by Stevens (1996). Hence, it was concluded that all of the indicators were not problematic (see Table 4.8).
The second step was to assess the proposed measurement model as a whole with using several goodness-of-fit measures (see Table 4.0). The value of $\chi^2$/df was 2.912 which was smaller than the recommended $\chi^2$/df value of 3.0 (Kline, 1998). Therefore, this $\chi^2$/df statistic indicated that the model fit the data well. In addition, RMSEA and GFI were also calculated to ensure the absolute fit of the model. The calculated values for RMSEA and GFI were .077 and .983, respectively. Given that the acceptable range of RMSEA is from .50 to .08 and the GFI value close to 1.0 indicates a perfect fit, the researcher was certain that the model predicts the observed covariance or correlation matrix well (Hair et al., 1998). As for incremental and parsimony fit measures, NFI and CFI were also calculated. The reported value of each measure was .984 for NFI and .990 for CFI where the value of both measures close to 1.0 indicates a perfect fit. Thus, based on these fit measures and criteria, the measurement model seemed to fit the data well.
Structural Model Testing

The second step of the two-step approach was to test the hypothesized structural model after examining the measurement model. Again, the hypothesized model was tested with AMOS 4.0 program.

First, the identification condition of a model was evaluated. There were 55 distinct sample moments and 26 distinct parameters to be estimated. Thus, the degrees of freedom were 29, which indicated an overidentified model. The hypothesized model consisted of two second-order latent variables, three first-order latent variables and 10 manifested variables (see Figure 4.2). The five latent variables which comprised with Intangible Resources, Tangible Resources, Human Resources, Financial Resources, and Academic Resources. The second-order latent variable of intangible resources was hypothesized to influence the generation of tangible resources, which influence the attainment of several intercollegiate athletic goals (e.g., success in the field).

First, offending estimates were examined to ensure the adequacy of the parameter estimates (Hair et al., 1998; Hoyle, 1995). Prior to inspecting offending estimates, item-to-item correlations were computed (see Table 4.9). The results indicated that there was no negative error variance and all the parameter estimates were statistically significant (see Table 4.10). In addition, all values of correlation and covariance were reasonable and none of them was positive definite (see Table 4.11).

Further, the statistical significance of the parameter estimates was examined with critical ratio (C.R.). The result of regression weights indicated that the critical ratio of unstandardized estimates were higher than 1.96 (ranging from 2.028 to 24.898), which
indicated that all parameter estimates in the model were statistically significant at .05 level (see Table 4.12).

Notes. Acr1, Acr2, and Academic denote Academic Reputation, History, and Academic Resources, respectively.

Figure 4.2: Resources Model for Intercollegiate Athletics
** p < .01 (2-tailed).
* p < .05 (2-tailed).

Table 4.9: Item-to-Item Correlations
### Table 4.10: Variances of Indicators in the Measurement Model

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int</td>
<td>0.153</td>
<td>0.039</td>
<td>3.956</td>
</tr>
<tr>
<td>Z1</td>
<td>0.144</td>
<td>0.042</td>
<td>3.408</td>
</tr>
<tr>
<td>Z2</td>
<td>0.052</td>
<td>0.019</td>
<td>2.730</td>
</tr>
<tr>
<td>Z3</td>
<td>0.328</td>
<td>0.037</td>
<td>8.864</td>
</tr>
<tr>
<td>Z4</td>
<td>0.094</td>
<td>0.031</td>
<td>3.048</td>
</tr>
<tr>
<td>E1</td>
<td>0.253</td>
<td>0.053</td>
<td>4.754</td>
</tr>
<tr>
<td>E2</td>
<td>0.527</td>
<td>0.061</td>
<td>8.569</td>
</tr>
<tr>
<td>E3</td>
<td>0.677</td>
<td>0.062</td>
<td>10.995</td>
</tr>
<tr>
<td>E4</td>
<td>0.085</td>
<td>0.027</td>
<td>3.139</td>
</tr>
<tr>
<td>E5</td>
<td>0.417</td>
<td>0.037</td>
<td>11.336</td>
</tr>
<tr>
<td>E6</td>
<td>0.085</td>
<td>0.025</td>
<td>3.415</td>
</tr>
<tr>
<td>E7</td>
<td>0.185</td>
<td>0.026</td>
<td>7.201</td>
</tr>
<tr>
<td>E8</td>
<td>0.178</td>
<td>0.024</td>
<td>7.484</td>
</tr>
<tr>
<td>E9</td>
<td>0.983</td>
<td>0.077</td>
<td>12.694</td>
</tr>
<tr>
<td>E10</td>
<td>0.938</td>
<td>0.074</td>
<td>12.646</td>
</tr>
</tbody>
</table>

### Table 4.11: Covariance and Correlation of the Model

<table>
<thead>
<tr>
<th>Covariance</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>e10 ↔ ACR</td>
<td>0.126</td>
<td>0.024</td>
<td>5.154</td>
<td>0.690</td>
</tr>
<tr>
<td>HR ↔ ACR</td>
<td>0.254</td>
<td>0.040</td>
<td>6.350</td>
<td>0.580</td>
</tr>
</tbody>
</table>

Table 4.10: Variances of Indicators in the Measurement Model

Table 4.11: Covariance and Correlation of the Model
<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>Standardized Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tan ← Int</td>
<td>1.683</td>
<td>0.232</td>
<td>7.265</td>
<td>0.907</td>
</tr>
<tr>
<td>Fin/Physi ← Tan</td>
<td>1.000</td>
<td></td>
<td></td>
<td>0.954</td>
</tr>
<tr>
<td>Human ← Tan</td>
<td>0.957</td>
<td>0.078</td>
<td>12.195</td>
<td>0.772</td>
</tr>
<tr>
<td>Academic ← Int</td>
<td>1.000</td>
<td></td>
<td></td>
<td>0.718</td>
</tr>
<tr>
<td>Fin2 ← Fin</td>
<td>1.000</td>
<td></td>
<td></td>
<td>0.763</td>
</tr>
<tr>
<td>Fin1 ← Fin</td>
<td>1.254</td>
<td>0.070</td>
<td>17.877</td>
<td>0.957</td>
</tr>
<tr>
<td>HR2 ← HR</td>
<td>1.000</td>
<td></td>
<td></td>
<td>0.902</td>
</tr>
<tr>
<td>HR1 ← HR</td>
<td>1.060</td>
<td>0.043</td>
<td>24.898</td>
<td>0.957</td>
</tr>
<tr>
<td>Acr1 ← Academic</td>
<td>1.212</td>
<td>0.139</td>
<td>8.749</td>
<td>0.674</td>
</tr>
<tr>
<td>Atr1 ← Int</td>
<td>2.203</td>
<td>0.289</td>
<td>7.626</td>
<td>0.864</td>
</tr>
<tr>
<td>Grad ← Int</td>
<td>0.335</td>
<td>0.079</td>
<td>4.219</td>
<td>0.244</td>
</tr>
<tr>
<td>Equity ← Int</td>
<td>0.161</td>
<td>0.079</td>
<td>2.028</td>
<td>0.117</td>
</tr>
<tr>
<td>Sears ← Int</td>
<td>1.246</td>
<td>0.080</td>
<td>15.541</td>
<td>0.906</td>
</tr>
<tr>
<td>Acr2 ← Academic</td>
<td>1.000</td>
<td></td>
<td></td>
<td>0.552</td>
</tr>
</tbody>
</table>

Table 4.12: Regression Weights in the Model
Second, the overall model fit was evaluated with several fit indices. The modification indices suggested including two correlations between error terms. Those were correlations between the error terms of (a) Human Resources and Academic Resources, and (b) Education (Graduation Rate) and Academic Reputation. The suggestions from the modification indices were theoretically plausible. The high correlation between Human Resources and Academic Resources was expected because student-athletes’ college choice decisions are partly influenced by academic reputation of institutions. One additional correlation between Graduation Rate and Academic Reputation was also supported by the fact that the value of education (e.g., relative value of degrees) is somewhat related to academic reputation of the school. In addition, it is highly likely that academically reputed institutions have more resources to help students (e.g., larger numbers of academic supporting staffs). Based on these rationales, two additional correlations were included in the model and then model fit was calculated.

The chi-square statistics indicated that the discrepancy value of the model was 92.996 (p < .001). Since the sample size of the current study was large (N=324), $\chi^2$/df was used to fix the sample size effects. The value of $\chi^2$/df was 3.20 (92.996/29) which fell into the acceptable range (Bollen, 1989). In addition to chi-square statistics, two other absolute fit measures were utilized (i.e., RMSEA, GFI). The value of RMSEA was .08 which was in the acceptable range while GFI was .947. In regard to model fit indices, researchers are encouraged to use measures from each type of goodness-of-fit measures (Hair et al., 1998). In this study, NFI for incremental fit measures and CFI for parsimonious fit measures were used. The value of NFI was .952 and that of CFI was .966. The values of all fit indices indicated that the model fit the data well.
Path Analysis

Path analysis was conducted to explain causal relationships among variables in this study. The basic argument of the study was that intangible resources contribute to generating more tangible resources in the context of intercollegiate athletics. Further, the extent to which an athletic department possesses tangible resources directly influences the attainment of various intercollegiate athletic goals (e.g., graduation rate). Therefore, the hypothesized model suggests that intangible resources indirectly influence the extent to which an athletic department is successful in attaining collegiate athletic goals.

Path estimates were calculated by maximum likelihood estimation (MLE). In this study, it was hypothesized that each dependent variable was directly or indirectly influenced by three types of resources (e.g., fin/physical, human, intangible resources). As a result, three path coefficients were calculated and explained for each dependent variable (see Table 4.13 and Table 4.14).

<table>
<thead>
<tr>
<th>Causal Variable</th>
<th>Endogenous Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tangible</td>
</tr>
<tr>
<td>Intangible Resources</td>
<td></td>
</tr>
<tr>
<td>Direct Effect</td>
<td>.91</td>
</tr>
<tr>
<td>Indirect via Tangible</td>
<td>--</td>
</tr>
<tr>
<td>Tangible Resources</td>
<td></td>
</tr>
<tr>
<td>Direct Effect</td>
<td>--</td>
</tr>
</tbody>
</table>

Table 4.13: Decomposition of Standardized Effects for the Model of Resources
Table 4.14: Decomposition of Standardized Effects for Types of Resources

<table>
<thead>
<tr>
<th>Causal Variable</th>
<th>Tan</th>
<th>Fin/Ph</th>
<th>Human</th>
<th>Sears</th>
<th>Grad</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletic Reputation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect via Intangible</td>
<td>.78</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Indirect via Int &amp; Tan</td>
<td>--</td>
<td>.71</td>
<td>.60</td>
<td>.71</td>
<td>.19</td>
<td>.09</td>
</tr>
<tr>
<td>Academic Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect via Intangible</td>
<td>.66</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Indirect via Int &amp; Tan</td>
<td>--</td>
<td>.62</td>
<td>.50</td>
<td>.60</td>
<td>.16</td>
<td>.08</td>
</tr>
<tr>
<td>Financial Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct effect</td>
<td>.95</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Indirect via Tangible</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>.86</td>
<td>.23</td>
<td>.11</td>
</tr>
<tr>
<td>Human Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct effect</td>
<td>.77</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Indirect via Tangible</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>.70</td>
<td>.18</td>
<td>.09</td>
</tr>
</tbody>
</table>

Direct Effects

Intangible resources were strongly predictive of greater tangible resources (standard coefficient = .91). Tangible resources directly increased graduation rate of student-athletes (standardized coefficient = .24) as well as gender equity of female student-athletes (standardized coefficient = .12). Tangible resources had the greater positive effect on Sears Cup scores (standardized coefficient = .91).

Indirect Effects

The amount of tangible resources mediated the relationship between Intangible Resources and Sears Cup score (standardized coefficient for indirect effect = .83). More intangible resources predicted higher points on Sears Cup scores. Intangible resources also indirectly increased “graduation rate” of student-athletes (standardized coefficient
for indirect effect = .22) as well as “gender equity” of female student-athletes
(standardized coefficient for indirect effect = .11).

Model Comparison

An alternative model was generated and compared with the original model. One
basic approach concerning the relationships among different types of resources is to
consider no contributing relationship between each other. For example, Barney (1991)
suggested that resources of the firm can be categorized into three different groups (i.e.,
human, physical, and organizational resources). Yet, he did not refer to any causal or
contributing relationships among these. Accordingly, the alternative model considered
the categories of resources to be independent and uncorrelated, rather than dependent and
causal (see Figure 4.3).

There were 55 distinct sample moments and 29 distinct parameters to be
estimated. As a result, degrees of freedom were 26. The chi-square statistics indicated
that the alternative model has a discrepancy of 173.303. The $\chi^2$ value of the original
model was 92.996 with 29 degrees of freedom. Thus, the $\chi^2$ difference between two
models was 80.307 with 3 degrees of freedom differences. To be statistically significant,
the difference of chi-square with 3 degrees of freedom differences should be greater than
7.815 at $p < .05$

The alternative model fit was evaluated with the same fit indices used for the
original model. GFI, NFI, and CFI were .911, .911, and .922, respectively. On the other
hand, RMSEA was .132, which was in the unacceptable range. Most of all, $\chi^2$/df was
6.666, indicating that the model did not fit data well. Based on these indices, it was
concluded that the alternative model was not acceptable\(^1\). Thus, the original model was significantly different from the alternative model in a better way.

Figure 4.3: The Alternative Structural Equation Model

\(^1\) In addition to poor model fit, the alternative model had 2 out of 17 parameter estimates with standardized regression weights bigger than 1.0 as well as 5 parameter estimates with negative standardized regression weights.
CHAPTER 5

DISCUSSION

This chapter includes a summary of the results of the current study, discussion of the results, managerial implication, and recommendations for future research as well as limitations of the study.

Summary of the Current Study

This study was concerned with sources of competitive advantages in intercollegiate athletics. Specifically, the study explored the dynamics of gaining competitive advantages of NCAA Division I intercollegiate athletic departments by investigating influences of various resources on the attainment of intercollegiate athletic goals.

Given that the impact of intercollegiate athletics is significant in economic, social, political, educational, and institutional terms, each institution and athletic department have made great efforts to build a successful athletic department in every way. Despite all the efforts toward building a successful athletic department, only some enjoy competitive advantages over other athletic departments. For example, several universities (e.g., Stanford, Arizona) have been winners or top-rankers of the Sears Directors Cup standings
for several years. In this regard, the current study utilized the theory of RBV to explain the sources of such competitive advantages in the NCAA Division I context.

The RBV sees that an organization is seen as a bundle of productive resources (Penrose, 1958). Thus, this theory suggests that the sustainable competitive advantage of the firm comes from how organizations can obtain critical resources, and utilize those resources productively (Barney, 1991; Teece et al., 1997). Simply put, resources that are valuable, rare, inimitable, and not substitutable are considered to have the potential of a resource to contribute to competitive success (Barney, 1991).

In the context of intercollegiate athletics, a few sport management researchers have utilized the theory of RBV to explain sources of competitive advantages. For example, Smart and Wolfe (2000) explored the plausible sources of the Penn State Football team’s success in comparison to other Big Ten football teams. Cunningham and his associate (Cunningham, 2003; Cunningham & Sagas, in press) explored the impact of human resources in achieving academic and athletic effectiveness of athletic departments. All three studies suggested that the RBV is a useful theory to explain sources of competitive advantage in intercollegiate athletics. However, these studies were rather narrow in their scope. For example, Smart and Wolfe (2000) explored the source of competitive advantages for a single sport team (i.e., football team). Cunningham and his associate investigated the influence of a single type of resource (i.e., human resources). Thus, the proposed study intended to be far more comprehensive as it investigated the influence of several types of resources (i.e., intangible, and human, financial resources) on the attainment of several intercollegiate athletic goals (i.e., winning, education, and gender equity) for a large set of universities (i.e., NCAA Division I institutions).
The model examined the influences of resources on the attainment of three selected intercollegiate athletic goals. For performance goals, a proxy of the Sears Cup Score was selected. Proxies of graduation rate of student-athletes, and female student-athletes’ participation rates were utilized for developmental goals. In detail, in regard to developmental goals, this study intended to capture “Student-athlete academic achievement” and “Student-athlete careers” with Student-athletes’ graduation rate, and “Organizational culture of diversity” and some aspects of “Student-athlete careers” for female participants with Female student-athletes’ participation rates. As for developmental goals, the current study intended to measure “Winning”, “Entertainment”, and “University visibility and prestige” by using a proxy of Sears Cup Scores.

Resource Categorization

One of the basic assumptions for the current study was that resources can be categorized into several groups (Barney, 1991; Wernerfelt, 1984). In this study, intercollegiate athletic resources were categorized into intangible (i.e., athletic reputation, academic resources) and tangible resources (i.e., human and financial/physical resources).

The results of measurement and structural model supported the basic argument of the current study concerning resource categorizations. In the measurement model, the values of composite reliability for each construct (i.e., construct reliability) of Financial/Physical Resources, Human Resources, and Academic Resources were .855, .928, and .563, respectively. Variances extracted for Financial/Physical Resources, Human Resources, and Academic Resources were .749, .865, and .392, respectively. While variance extracted for Academic Resources was a little bit smaller than the
desirable value, such a small value was due to the nature of intangible resources. For example, Godfrey and Hill (1995) argued that intangible resources are unobservable and, therefore, are difficult to be tested. Considering the nature of intangible resources (e.g., Academic Resources), the resource categorization in this study was quite valid.2

Intangible Resources in Intercollegiate Athletics

The primary purpose of the study was to illustrate the criticalness of intangible resources (e.g., athletic reputation) on the attainment of various intercollegiate athletics goals by generating more tangible resources (e.g., financial resources). In the strategic management literature, intangible resources refer to “all items not appearing in the material reports (balance sheets) such as organizational culture, reputation, and internal control” (Carmeli, 2004, p. 111). Since intangible resources are less flexible and non-imitable, “intangible, more than tangible, resources have potential for competitive advantage creation” (Carmeli, 2004, p. 112).

In the context of intercollegiate athletics, it was suggested that reputation, history, and culture play significant roles as sources of competitive advantages. One critical argument in strategic management, especially in the RBV, is that organizations are path-dependent (Barney, 1991) because tradition/history might be associated with first-mover advantages (Arthur, 1989). In that the first-mover in a given market can form strategic relationships with critical stakeholders (e.g., suppliers, consumers, etc) prior to other competitors, organizations with greater history (e.g., an organization established earlier than others) can have the benefit of competitive advantages. In addition, it has been suggested that the position and behavior of the organization is often decided by the past

2 It should be noted that Athletic Reputation was measured by single item and therefore was not included in the CFA.
experience of the organization (Barney, 1991; Teece et al., 1997). Likewise, an organization’s accumulation of resources and capabilities can be path-dependent (Dierickx & Cool, 1989). Path-dependence makes resources inimitable and nontradable in that each organization has differently interacted with the environments and developed unique organizational routines (Barney, 1991; Nelson, & Winter, 1982) as well as unique organizational culture (Barney, 1986). Given that history matters for the logic of path dependency (Teece et al., 1997), it was suggested that the history of the institution (operationalized by years since establishment) could be a good measure to assess one of organizational resources. Therefore, years since establishment of the university would be a good a proxy for the tradition and culture of each university.

As one of intangible resources, reputations of institutions as well as that of athletic departments were hypothesized to play critical roles in gaining competitive advantage of athletic department. Each athletic department is housed in the boundary of higher educational institutions. Thus, the influence of institutional reputation on the success of an athletic department is inevitable.

Reputation was defined as “the evaluation of a firm by its stakeholders in terms of their affect, esteem, and knowledge” (Deephouse, 2000) and is considered as a major source of competitive advantages (Deephouse, 2000; Hall, 1993). One of the reasons is that a positive (or superior) reputation makes an organization able to be defensible against competitors because competitors need substantial amounts of efforts and time to be comparable with existing reputed organizations (Hall, 1993). Especially, the importance of reputation becomes greater because reputation is highly associated with the competence of an organization. Given that a positive reputation is “the product of years
of demonstrated superior competence” (Hall, 1993, p. 616), reputation as a critical intangible resource was expected to be a source of competitive advantages in the context of intercollegiate athletics.

The results of the study indicated that intangible resources do contribute to generate more tangible resources such as financial resources and human resources. The standardized regression weight of .91 (significant at the level of .01) indicated that the construct of intangible resources explained more than 83% of the generation of tangible resources in the collegiate sports context. In this study, tangible resources of athletic departments were categorized by “Financial/Physical” and “Human” resources. When Financial/Physical resources were operationalized by the amount of sports and administrative expenses and Human resources were operationalized by numbers of coaches and student-athletes, the degree of tangible resources was more predictive of the extent to which an athletic department possesses Financial/Physical resources (standardized coefficient = .86, p < .01) than Human resources (standardized coefficient = .70, p < .01). In this regard, one reason can be that the NCAA rules and regulations place some constraints on the numbers of coaches and student-athletes. Given that the maximum and/or minimum numbers of human resources are monitored by the NCAA, athletic departments with superior intangible resources may be more restricted from having larger pools of human resources while such restrictions are not imposed on financial/physical resources.

Most of all, tangible resources were significantly predictive of the amount of Sears Cup Scores for each athletic department (standardized regression weight = .91, p < .01). In addition, Sears Cup scores were indirectly determined by the amount of
intangible resources of athletic departments (indirect standardized regression weight = .83, p < .01). These results suggested that the degree of achieving performance goals (e.g., winning, university prestige, entertainment) was directly and indirectly determined by the extent to which an athletic department possesses critical tangible and intangible resources.

When it comes to developmental goals, the influences of resources on the goal attainment were less predictive in comparison to performance goals. Graduation rate of student-athletes directly increased as the amount of tangible resources increased department (standardized regression weight = .24, p < .01). Greater intangible resources predicted higher graduation rate of student-athletes (indirect standardized regression weight = .22, p < .01). The effects of tangible and intangible resources on gender equity were the weakest. As tangible resources increased, gender equity in terms of female participation rates increased (standardized regression weight = .12, p < .05). Intangible resources were, to certain extent, predictive of greater gender equity (indirect standardized regression weight = .11, p < .05).

Overall, the direct and indirect effects of predictive variables (i.e., tangible and intangible resources) on the attainment of selected intercollegiate athletic goals were significant, which indicated that resources can be units of analysis to understand competitive advantages in intercollegiate athletics. Yet, it is of concern that the predictive power of resources on attaining developmental goals was smaller in comparison to performance goals. However, these differential influences can be attributed to the fact that achievement of developmental goals is partly dependent on the decisions of student-athletes, rather than athletic departments themselves. For example, a decision to quit
participating as a student-athletes, or a decision to get into the draft to be a professional sport player are mostly decided by student-athletes’ choices. On the other hand, the success in the field (i.e., winning) is, to a great extent, dependent on the efforts made by athletic departments or institutions (e.g., decisions to allocate more general funds to athletic department budgets). From a different perspective, student-athletes are recruited and/or selected based largely on their athletic talents than on their academic potential. Therefore, it is not surprising that the resources had greater impact on performance goals than on developmental goals.

The weak relationships between intangible resources and gender equity could be an artifact of the fact that gender equity a relatively more stable attribute than the other two outcome measures (Sears Cup scores and graduation rates). While the latter outcome measures fluctuate from year to year, gender equity represented by the ratio of female athletes to male athletes may remain constant over a period of years. At any rate, the present results suggest that the tangible and intangible resources can be used as units of analysis in examining competitive advantages in intercollegiate athletics.

Managerial Implications

The primary purpose of strategic management practices is to search for sources of competitive advantages (Grant, 1991). Since identifying sources of competitive advantage can help managers to develop their own best strategies, the importance of such information is also applicable to the context of intercollegiate athletics. In this regard, there have been efforts to explore sources of competitive advantages in the sport management literature, there is almost no comprehensive study that guide athletic
directors (i.e., sport managers) for better effectiveness as well as efficiency in utilizing resources under their control.

One of the critical findings in this study is the criticalness of intangible resources (e.g., athletic and academic reputation, history and tradition) in the context of intercollegiate athletics. Beyond suggesting the intangible resources’ contributions to achieve intercollegiate athletic goals, the current study also suggests that intangible resources contribute to facilitate and/or generate more tangible resources (i.e., contributing resources). Thus, from a managerial perspective, this study is significant in that it highlights the relationships between intangible and tangible resources and their effects on the attainment of the goals of intercollegiate athletics.

While recognizing the distinction between intangible and tangible resources, administrators of intercollegiate athletics should also make efforts to generate both kinds of resources. They should also realize that the generation of tangible resources requires concerted efforts that bear fruits in the short run. For example, the goal of collecting a certain amount of dollars within a year would entail concerted and consistent media and personal campaign. The results of these efforts can be assessed relatively more objectively at the end of the year. On the other hand cultivating athletic and academic reputation is a long-term phenomenon and the success of the efforts in this regard can not easily be judged. While the present study has shown that the intangible resources influence both the tangible resources and the outcome variables, it is recognized that the attainment of the outcomes would, in turn, enhance the intangible resources. By the same token, non-attainment of the desired outcomes may tarnish the intangible resources. But even more perilous is the fact that the attainment of the athletic goals through improper
means may actually reduce the intangible resources. For instance, a university athletic department may win several championships in several sports. If these achievements were to be shown as a function of the athletic department violating pertinent rules relating to academic eligibility and the use of performance enhancing drugs, then the intangible resources would be considerably reduced. Hence, the administrators of athletic department have to be vigilant in promoting the long-term intangible reputation (both academic and athletic) of the university through current legal and moral practices in the pursuit of current performance and developmental goals.

As Carmeli (2004) noted, the tangible resources are more “flexible” as opposed to more intangible resources which are “inflexible.” Since flexible resources can be easily put to different uses (e.g., using the available money to buy equipment or pay for travel), organizations would prefer more tangible resources rather than intangible resources. Further, it takes more time to cultivate intangible resources in comparison to obtaining tangible resources. In addition, managers are often expected to be successful in the short run and accordingly their performance evaluations are often decided annually. Thus, it might be inevitable that athletic directors look for tangible resources which can be obtained in a relatively short period. Finally, although the intangibles are valuable, they are not observable (Godfrey & Gregersen, 1999). Therefore, sport managers may not see the importance of intangibles as they do not observe them. Because of these contingencies, sport managers might be negligent regarding the importance of intangible resources in intercollegiate athletics. But as noted, it is imperative that managers focus evenly on garnering both the intangible and tangible resources.
As noted, building intangible resources takes considerable time relative to securing the tangibles. In attempting to build the intangible resources, managers must note that they may not have much to do with changing the history of the university and its athletic department (a measure of intangible resources used in the present study). On the other hand, the reputation of an athletic department or an institution is relatively easier to change. Thus, athletic directors should pay more attention to enhancing the reputation of the athletic department rather than its history or tradition.

It must also be noted that reputation is composed of fame and esteem (Hall, 1993). According to Hall, “fame can be bought with advertising in a short time, but esteem has to be earned, usually over a long period of time” (p. 44). Thus, managers of athletic departments while seeking fame must also be cognizant of building the esteem component of reputation over a period of time. While winning competitions and championships may engender fame, continued successes over the years and the legal and moral practices are the ingredients for long-term cultivation of esteem.

The securing of both intangible and tangible resources always involves relationships with stakeholders of the athletic department. For example, “years since establishment” of institutions implicitly include numbers of alumni, and tradition of institutions with stakeholder groups because institutions with greater years since establishment could have had more chances to interact with stakeholder groups in comparison to younger institutions. One of the difficulties managers of intercollegiate athletics would face is that some of the stakeholders (e.g., boosters) may be powerful enough and willing enough to engage in illegal, immoral, and non-educational activities in order to see their teams win. While resource acquisition would necessitate interactions
with such stakeholders and could result in additional resources, efforts must be taken to curb their activities that might tarnish the reputation of the university.

As Post, Preston, and Sachs (2002) noted, the stakeholder view of the organization and the resources based view run parallel and underscore the dynamic and longitudinal relationships between stakeholders and resources. That is, every resource that an athletic department can boast of comes from or has come from one or more stakeholders. Thus, “the failure to establish and maintain productive relationships with all of the firm’s stakeholders is a failure to effectively manage the organizations’ capacity to generate future wealth” (p. 53).

Based on such a rationale, therefore, it is proposed that the stakeholder groups also can be classified based on what resources each group possesses and controls (e.g., financial resource providers and marketing resource providers as stakeholder groups). Based on the RBV literature, critical amount or quality of resources can bring sustainable competitive advantages (SCA) for an organization, managers should consider which and how much resources stakeholder groups can provide (or have potential to provide) for the organization. If organization can effectively manage and prioritize stakeholder groups with critical resources, the organization can achieve the SCA over competitors. Therefore, we propose that this classification can be a criterion for primary and secondary stakeholders.

Limitations and Recommendations

The limitations of the current study are associated with the issues concerning concept of “valuable resources” as well as the types of data collected. The limitations of the current study are listed below with recommendations for the future studies.
One of the differences between RBV and the traditional economics theory is that the RBV includes critical resources that do not comply with mathematical formulas of economics. Simply put, the RBV emphasizes the importance of unobservable factors that are not shown in the balance sheets of organizations (Godfrey & Hill, 1995; Wernerfelt, 1984). Especially, the theory of RBV argues that inimitable and non-substitutable resources are highly likely to be sources of competitive advantages because such resources can be barriers for other competitors (Barney, 1991; Wernerfelt, 1984). Since the theory itself comes with the importance of unobservable, or difficult to observe resources, it leads inevitably to the difficulty of identifying and measuring the critical but intangible resources.

The next possible limitation is concerned with the data and the method of collecting the data. While the use of the available data (i.e., archival data) has its own advantages, it also entails some limitations. For example, it is difficult to directly measure “tradition” or “history” of an athletic department. In this regard, “years since establishment” would be a good proxy to illustrate both history and tradition of each athletic department. However, the use of available data as proxies raises the issue of key concepts; that is, not capturing what is supposed to be measured (Singleton & Straits, 1999). Future studies need to explore if there are other direct measures or even better proxy measures for key concepts. It would also be fruitful to attempt to develop direct indicators that best capture concepts of critical resources.

Another limitation is associated with university characteristics or university policies. The primary purpose of the current study was to explore the dynamics of gaining competitive advantages at NCAA Division I level. As the current study used
structural equation modeling which requires a certain size of the sample based on numbers of parameter estimates. Hence, all universities in Division I including those that did not have football programs were included. Such an approach ignores the significant impact of the presence of a football program in a university athletic department. In other words, the differences among Division I-A, AA, and AAA institutions were not explored. Future studies may use different statistical approaches which can test subgroup differences in regard to gaining competitive advantages.

Following the above point, it is suggested that the differences among the goals sought by different categories of university athletic departments must be taken into account in future studies. The researcher in this study selected the three most critical intercollegiate goals. Yet, it is possible that different goals may have more value in different contexts (e.g., NCAA Division III context). Thus, future research may incorporate different types of intercollegiate athletic goals that are relevant to a given context (e.g., NCAA Division II and III settings).

Future studies may also test the model of resources in other sport settings such as the professional sport leagues. However, it must be noted that professional sport franchises are concerned with only one sport whereas intercollegiate athletics deal with several sports. Further, intercollegiate athletics is also concerned with the dual and at times contradictory goals of performance and development of athletes.

While the present study has shown the influence of the various resources on attainment of athletic department goals, it dealt with the existence of specific resources among the university athletic department. However, it did not address the issue of how well the available resources were utilized. It is one thing to say that a university has
such and such resources and it is another thing to say how the managers of a university put those resources to different uses and exploited the advantages accruing from those resources. The ability to exploit the available resources and reap the potential competitive advantage has been labeled “organizational capability” (Teece et al., 1997). Future studies may include a measure of such capability and assess its contribution to competitive advantage.

Finally, three significant avenues for future research are suggested. First, it was found that the forms of resources included in the study were related to the attainment of both developmental and performance goals. It was also alluded to earlier that managerial competence in exploiting the available resources is equally critical. The intangible resources such as the reputation of an organization are a function of past organizational competence and managerial capabilities (Hall, 1993). From this perspective, the measure of organizational reputation can be considered a surrogate measure of organizational competence. However, it does not reflect the current competence of the organization or its managers. And, it is the current capacity to exploit the available resources that influences current performance of the organization. Hence it is important that future studies must take this capability as a critical resource. It is recognized that measuring current capacity would be difficult as they are not easily observable. Such an effort should begin with the development of psychometrically sound measures of organizational and managerial competence.

Another avenue for exploration is the differential effects of organizational resources on the attainment of developmental and performance goals. The association between the resources included in the present study with the attainment of performance
goals was much stronger than their association with the attainment of developmental
goals. Obviously, the resources included in the present study are more related to athletic
performance than to academic achievement. In so far as the attainment of developmental
goals is equally emphasized by universities and their stakeholders, it becomes important
to identify those resources that contribute to developmental goals. For instance, the
amount of sports and administrative expenses included in the study could be broken
down into those that facilitate developmental goals and those that facilitate performance
goals. In addition, the university wide efforts to foster academic development and
maintain its academic reputation must also be considered as a form of resource related to
developmental goals.

Lastly, the primary purpose of the current study was to investigate the
contributing relationship between intangible and tangible resources, and their overall
impact on the attainment of organizational goals. It did not, however, address the issue of
the feedback loop from goal attainment back to intangible resources. If intangible
resources are a function of goal attainment in the past, current goal attainment should
influence the intangible resources for the future. Any research investigating this
relationship should be longitudinal in nature. As we can not get any data on future status
of organizations, the investigation of this feedback effect needs to be historical. As the
measures used in the study are available for a number of years, a researcher could collect
the data from the past several years, and asses the circular relationships among intangible
resources, tangible resources, and goal attainment.


