HOW A LEARNING ORIENTATION, MODERN PORTFOLIO THEORY AND ABSORPTIVE CAPACITY CONTRIBUTE TO UNIVERSITY ENDOWMENT PERFORMANCE

by

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For the degree of Doctor of Philosophy

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DEDICATION

To my husband, Jim Wilson, and my mother, Elizabeth Lord, for their steadfast support and patience.

Also, to our fabulous children: Heather and Nathan Wilson.
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In terms of helping me advance my research, I express my appreciation both to those who helped me with skill development and those who helped with theory and research development. In the area of skill development, I am grateful to Sheri Perelli (who forced me to have greater rigor in my qualitative study), James Gaskin (for his patience in tutoring me in structural equation modeling), Toni Somers (for her consultations and careful review of my statistical analyses in both quant studies) and Kalle Lyytinen (for his rapid-fire feedback on homework assignments in our statistics measurement course). In the area of theory and research design, I am very grateful to Tim Fogarty, who undoubtedly didn’t know what he was getting into when I asked for a meeting back in 2007 to discuss institutional theory. Tim has an amazing ability to see through noise and get to the most interesting aspects of a project. He also is full of practical advice and stays focused on the road to completion. I am most grateful for his
wit, warmth and willingness to serve as chair of my committee. Simon Peck served as an advisor on one of my papers and was most helpful in guiding me to pertinent literature and warning me about using certain constructs where I would be unlikely to get sufficient variance. I am delighted to have gotten to know Diana Bilimoria in the latter part of my journey and grateful for her interest in my research topic; we have agreed to co-write an article that stems partly from my dissertation and I look forward to the collaboration.

Kalle Lyytinen deserves a second accolade for his immense contributions in our PhD workshops in which he pressed us to go deeper into theory and to become more confident in both making and defending our research contributions. I am most grateful for the knowledge he has shared, drawing both from his immense capabilities in theory and in methodology.

A note of thanks is in order to the folks at the National Association of College and University Business Officers (NACUBO) with whom I have worked on endowment-related topics over the past decade, starting in the early 2000s when I was involved in their annual study of endowments while employed at TIAA-CREF. My collaboration with them included articles and sessions at conferences and seminars, and they generously provided me with data on university endowment performance and asset allocation that were invaluable to my dissertation research.

Words are an insufficient means of expressing my thanks to Sue Nartker and Marilyn Chorman for their leadership and support in administering such a demanding program. They expertly handled so many administrative hurdles and time-consuming details that undoubtedly made the difference between the program being insurmountable.
and just daunting. Their dedication to students’ success is unwavering, and they provide humor, caring, and a sense of cohesiveness to the entire program.

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I had a special treat while working on my quant paper that examined how investment committees use the principles of Modern Portfolio Theory in their portfolio decisions. I developed a scale to use in my survey that would hopefully capture the essence of the theory, developed by Harry Markowitz in the 1950s. Feeling surprisingly confident one day in early 2011, I decided to send the Nobel laureate an email asking if he’d be interested in reviewing my paper. To my great delight, he invited me to visit him in California and I enjoyed a wonderful luncheon (fish, chips and Guinness) and seaside walk with him in which we discussed everything from my paper to the causes of the financial crisis to his favorite Marx Brothers episodes.

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How a Learning Orientation, Modern Portfolio Theory and Absorptive Capacity Contribute to University Endowment Performance

Abstract

by

MARY E. LORD

University endowments with broad portfolio diversification have been correlated with superior performance, but antecedents to investment committees’ asset allocation decisions have received little attention. This research examines the composition and group norms of investment committees that influence their processes of information acquisition, analysis, and decision-making. Three group norms—shared vision, open-mindedness and a commitment to learning—were found to contribute to greater acquisition of relevant external knowledge, which led to greater exploitation of the expanded knowledge. That process of building absorptive capacity was found to contribute to greater portfolio diversification and higher risk-adjusted returns. Committee expertise in a variety of investment asset classes had a significant effect both on absorptive capacity and on portfolio diversification. A scale was developed to measure the committee’s use of Modern Portfolio Theory principles, another contributor to portfolio diversification. In sum, the three research papers in this dissertation provide insights regarding how institutional investment management committees overcome
typical investor biases that keep them from adopting broader portfolio diversification. Implications for endowment leaders are to obtain diversified investment expertise on the committee and to foster a learning-oriented climate where knowledge and capabilities are expanded and effective decisions are made.

Key words: University endowments: portfolio diversification; absorptive capacity; learning orientation; functional diversity; shared vision; learning commitment; open-mindedness.
INTRODUCTION

The purpose of this research is to examine university endowment investment committees and committee-specific factors that lead to broader portfolio diversification and higher risk-adjusted performance. Portfolios with greater asset-class diversification are known to produce higher risk-adjusted returns, yet researchers have paid scant attention to group characteristics--including committee composition, group climate (or norms), and processes--that influence portfolio diversification.

The overall dissertation represents a mixed-methods approach including a qualitative study based on interviews with 20 financial officers at colleges and universities and two quantitative studies based on a survey of financial officers at 168 U.S. universities. The survey data were augmented with objective data on asset allocations and 5-year performance from annual industry surveys. All three studies were written as stand-alone research papers in formats for submission to academic conferences.

The qualitative study, using a grounded theory approach, helped to identify a set of differentiating factors between committees of high-performing and low-performing endowments of similar asset size. Without exception, the top performers stated that the steps they had taken to diversify their portfolios into a wider range of asset classes had been beneficial. Investment committees at top-performing endowments were described as having greater investment experience than those at poor-performing endowments, and they also engaged in more concerted group efforts to learn from one another and from external sources. They were more focused on the risk-return profile of the overall portfolio and on how the addition of new asset classes would impact performance in
different environments and over time. This contrasted with a narrower approach on specific investments that was exemplified by committees of poor-performing endowments. Dialogues and debates of top-performing committees were described as very spirited and fact-seeking; differing views were encouraged and assessed in depth.

The picture that emerged from top-performing committees was that of a group of people who were committed to continual learning and improving their collective competence. They demonstrated greater collective efficacy and a greater sense of responsibility and control over their decisions and the outcomes. Committees of poor-performing endowments, in contrast, tended to consider unfamiliar asset classes as too risky and were not as inclined to engage in intensive learning efforts and critical assessments as were the top performers. As a result, their portfolios ended up being more volatile and suffered greater downturns due to lack of diversification. The qualitative paper is provided in its entirety in Appendix G.

The findings of my qualitative study informed the choice of constructs and hypotheses for designing the survey that was sent to financial officers of all U.S. endowments for which a minimum of five years of performance data were available. I have completed two quantitative studies using the survey data, both examining committee characteristics and processes that influence portfolio diversification and risk-adjusted performance. The first, provided in Appendix H, examines how the committee’s use of Modern Portfolio Theory (MPT) principles helps to explain the effects of certain group characteristics on portfolio outcomes. MPT principles involve the construction of a portfolio so that it encompasses assessments of potential returns, potential risk (or volatility) and the correlation of returns of the assets. Among the findings was that a
group climate of open-minded debates leads to greater use of MPT principles and higher risk-adjusted returns.

My second quantitative study, in Chapter III, forms the core of the dissertation by focusing on factors that influence the competence, or absorptive capacity, of the committee. It examines how the composition of the committee and a set of group norms called learning orientation contribute to greater absorptive capacity, broader portfolio diversification and higher risk-adjusted returns. Although the two quantitative studies have certain overlapping variables and literature references, the first (in Appendix H) focuses on specific portfolio considerations relating to Modern Portfolio Theory while the second focuses more broadly on competence building.

I have structured the dissertation as follows: The first chapter provides background information regarding the role and importance of endowments in university (and college) finances and the role of investment committees in the governance of the endowment. Next, I review prior academic research related to portfolio diversification and performance, both at the individual investor level and in the university endowment domain. That review, based largely on concepts from behavioral finance, is particularly focused on investor characteristics and conditions that either contribute to or impede portfolio diversification. The third chapter, as described above, uses the absorptive capacity framework as a mediator of the effects of group characteristics and norms on portfolio diversification. This quantitative study is unique in employing the absorptive capacity framework in an entirely new domain as well as in introducing the second-order factor called learning orientation as an antecedent to absorptive capacity. Chapter four, called “Overall Reflections from the Dissertation Project,” describes my learning journey
throughout the research project. The reference section following chapter four includes references from all of the first four chapters. For the two standalone papers in the appendices, I have kept references intact at the end of each paper.

In sum, I believe this body of research provides important implications for university endowment leaders regarding the selection of investment committee members and the type of group climate or norms that contribute to effective decision-making. Those norms include a commitment to learning and working toward common goals, as well as an appreciation for critical assessment of members’ assumptions and viewpoints. In addition, unlike previous research on university endowments, my studies explore how certain committee factors help to explain performance differences among endowments of similar size. Within the field it is well known that very large endowments from prestigious institutions tend to have superior performance, but that is not particularly helpful to smaller endowments or endowments of any size with sub-par performance. This dissertation thus provides practical insights which, hopefully, will be beneficial to leaders of any endowment team seeking broader portfolio diversification and superior risk-adjusted returns. Other types of governing boards and decision-making groups also may appreciate the findings regarding how the composition and norms of groups contribute to improved information acquisition, analysis and competence.
CHAPTER I: ENDOWMENTS AND COMMITTEES

University Finances and the Role of the Endowment

Understanding factors that contribute to investment portfolio performance is critical for college and university leaders since the endowment earnings can have a significant impact on the financial health of the institution (Brown, Dimmock, Kang, & Weisbenner, 2010). Investment performance of university endowments has taken on added significance due to declines in the financial markets, donor giving and state allocations to higher education (Ehrenberg, 2009). Distributions from endowments now make up a larger share of university budgets than ever recorded (Brown, Dimmock, Kang, Richardson, & Weisbenner, 2011), and universities increasingly emphasize the importance of both donor giving and endowment performance.

A university’s endowment is the pool of assets that are managed to provide financial support to the institution, meeting both short-term cash flow needs as well as long-term needs for portfolio growth (Ehrenberg, 2009). The endowment is generally referred to as one large portfolio although it typically consists of hundreds or even thousands of endowments serving different purposes that range from scholarships to endowed chairs to facility construction. Specific-purpose endowments are called restricted funds while unrestricted funds may be used to support whatever expenditures the university considers important. Although the overall portfolio may be integrated for investment management, separate accounting and spending policies may apply to the specific endowments. Those called “quasi-endowments” generally provide universities with the most discretion with regards to spending both income and principal whereas “true” endowments usually prohibit the spending of original principal, and “term”
endowments specify the conditions that must be met in order to spend principal (Yoder, 2004). Endowments can be built through a combination of donor giving (importantly from alumni), set-asides from the university (such as excess operating funds), and investment returns in excess of the annual spending.

According to the NACUBO-Commonfund Study of Endowments (2009), spending from the endowment makes up, on average, 13.4% of university operating budgets; the percentage tends to be significantly higher for private, well-endowed institutions and considerably lower for public, less-endowed institutions. At Harvard and Yale, for example, more than 30% of university operating costs are covered by endowment spending. The graph in Figure 1 shows the average percentage of college and university operating budgets that are funded by distributions (or spending) from the endowment, for each of six size categories of endowments.

FIGURE 1
Percentage of Higher Ed Operating Budget Funded by Endowment (grouped by size of endowment, includes public and private)

Source: 2009 NACUBO-Commonfund Study of Endowments
A significant level of support from the endowment, and especially from unrestricted funds, helps to augment university autonomy and financial stability. Greater financial strength improves the institution’s ability to conduct long-range planning and to have greater flexibility in hiring talent, conducting research and developing curricula. Spending policies vary from one institution to another. A commonly used annual spending policy is to withdraw 5% of the recent three-year average value of the endowment, although this can result in disruptive swings due to changing market valuations. A growing trend toward smoother spending, therefore, involves increasing the annual withdrawals by the rate of inflation or some combination of changes in inflation and market values (Lord & Throneburg, 2006).

Public institutions have suffered declines in per-student government funding, related to both sizable increases in enrollment and strained state budgets, and thus need to rely more on other sources of income such as tuition and the endowment. According to a report by the College Board (2011), state appropriations per full-time equivalent (FTE) student dropped by 4% in constant dollars in 2010-11, after dropping 6% in 2009-10 and 9% in 2008-9. Over the past decade, state funding per FTE student for higher-education institutions dropped 23% in inflation-adjusted dollars (College Board, 2011). Private institutions, while less impacted by cuts in government funding, have been more affected by investment declines since spending from the endowment makes up a bigger percentage of their budgets. Although endowment values have appreciated from their lows during the 2008-2009 financial crisis, they are still 14% below their 2007 levels, on average, as of June 30, 2011 (Eaton, 2011). Obviously, institutions with superior
endowment performance have been less affected than those which suffered outsized declines.

With strained resources and greater needs to provide financial aid to students, operational budgets at both public and private institutions have been squeezed and institutions have needed to raise tuition rates, particularly at public institutions. Average tuition and fees at public four-year colleges rose by 9% beyond inflation in 2009-10 and by 7% in 2010-11 (College Board, 2011). The ratio of full-time faculty to full-time students has dropped in recent years (College Board, 2011) and salary increases for full-time faculty pay increases have lagged the inflation rate (Hebel, 2011).

In aggregate, U.S. higher education endowment assets exceed $400 billion; those at independent institutions make up 71.5% of assets and those at public institutions make up 28.5% (NACUBO, 2008). Independent institutions, on average, have $148,000 in endowment assets per full-time equivalent (FTE) student while public institutions have $22,000 per FTE student (NACUBO, 2008). Endowment assets are highly concentrated among a small number of institutions in both the private and public sectors. Ten private doctoral universities hold about 45% of the total endowment assets of all private institutions, and 10 public doctoral universities hold about 35% of the total endowment assets of all public institutions (College Board, 2011; NACUBO-Commonfund, 2010). Although the direction of causality is unclear, well-endowed universities are correlated with academic quality. Swensen (2009) examined rankings of large, private institutions in the study by *U.S. News and World Report* and found a strong correlation between academic rank and endowment size (whether aggregate endowment value or endowment value per student).
Annual industry studies by NACUBO\(^1\) (2002-2008) have documented the long-term trend toward greater portfolio diversification at university endowments. As indicated in Table 1, major shifts have occurred out of U.S. equities and fixed income and into international equities and hedge funds. In addition, cash levels have been reduced and allocations to alternative investments have been increased. The data in the table are compiled by counting the percentages from each participating university equally. If computed on a dollar-weighted basis the percentages would differ significantly because large endowments have much smaller allocations to domestic equities, fixed income and cash, and much larger allocations to the alternative asset classes of hedge funds, private real estate, venture capital, private equity and natural resources (NACUBO, 2008).

Within publicly traded equities, the largest endowments (assets greater than $1 billion) allocated slightly more than half to international securities in 2008 while the smallest endowments (assets less than $25 million) allocated only 20% to international and thus 80% to domestic securities.

### TABLE 1
Shifts in University Endowment Asset Allocations, 1993-2008*
(Percentages of Equal-weighted Endowment Portfolios)

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>1993</th>
<th>2008</th>
<th>Asset Class</th>
<th>1993</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equities</td>
<td>48.1%</td>
<td>34.9%</td>
<td>Hedge Funds</td>
<td>0.7%</td>
<td>12.9%</td>
</tr>
<tr>
<td>International Equities</td>
<td>4.2%</td>
<td>17.0%</td>
<td>Venture Capital</td>
<td>0.2%</td>
<td>1.1%</td>
</tr>
<tr>
<td>U.S. Fixed Income</td>
<td>33.6%</td>
<td>17.6%</td>
<td>Private Equity</td>
<td>0.6%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Non U.S. Fixed Income</td>
<td>1.3%</td>
<td>1.7%</td>
<td>Natural Resources</td>
<td>0.3%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Real Estate (public)</td>
<td>0.0%</td>
<td>1.3%</td>
<td>Cash</td>
<td>7.3%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Real Estate (private)</td>
<td>1.6%</td>
<td>2.9%</td>
<td>Other</td>
<td>2.0%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

*NACUBO Endowment Studies, 1993-2008. Slight changes have occurred in asset classifications over the years. For example, the 2008 study contained a category called Global Fixed Income which was not listed in the 1993 study. We have included it in Non U.S. Fixed Income for 2008 although it likely contains both international and U.S. bonds.

\(^1\) The National Association of College and University Business Officers (NACUBO) conducted its own annual study of college and university endowments from 1984-2008. NACUBO joined with Commonfund Institute starting in 2009 to conduct the annual study, renamed the NACUBO-Commonfund Study of Endowments.
The ability of well-diversified portfolios to produce superior risk-adjusted returns relative to poorly-diversified portfolios has been well established by Modern Portfolio Theory (Markowitz, 1952, 1959), yet examples of poor diversification are plentiful both in individual and institutional portfolios. These often take the form of very heavy concentrations in 1-3 asset classes and essentially no exposure to any others. While smaller university endowments typically are less diversified across asset classes than larger ones, significant disparities in diversification exist among endowments of similar size and even among very large endowments (NACUBO, 2002-2008). Although diversification can provide clear benefits, industry participants strongly advise against committing funds to an asset class before understanding it and knowing how to select quality managers in that area (Lerner, Schoar, & Wang, 2008; Swensen, 2009).

Overall U.S. endowments have racked up enviable returns over the years, exceeding those of the S&P 500 and the Barclays Aggregate Bond Index (NACUBO, 2008). Over the 10-year span ended June 30, 2008, endowments in the NACUBO study produced annualized returns of 10.0% on a dollar-weighted basis and 6.5% on an equal-weighted basis. Large endowments have produced significantly higher returns than small ones, on average, as shown in Table 2. Unsurprisingly, larger endowments have considerably larger investment staff than smaller endowments. According to NACUBO (2008), endowments larger than $1 billion have an average of seven investment professionals on staff whereas those with $50 million to $100 million have an average of .1 person (or 10% of one person’s time) devoted to investments.
TABLE 2
10-Year Annualized Returns by Category Size
(through June 30, 2008)

<table>
<thead>
<tr>
<th>Size Category (Endowment Assets)</th>
<th>Annualized Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than $1 billion</td>
<td>9.5%</td>
</tr>
<tr>
<td>$500 mil to $1 billion</td>
<td>7.6%</td>
</tr>
<tr>
<td>$100 mil to $500 mil</td>
<td>6.4%</td>
</tr>
<tr>
<td>$50 mil to $100 mil</td>
<td>5.8%</td>
</tr>
<tr>
<td>$25 mil to $50 mil</td>
<td>5.1%</td>
</tr>
<tr>
<td>Less than $25 mil</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

NACUBO Endowment Study, 2008

Endowment portfolios were not spared the damage from the 2008-2009 credit crisis, dropping 18.7% on average during the fiscal year ended June 30, 2009 (NACUBO-Commonfund, 2009). Contrary to the typical pattern, the category of largest endowments (greater than $1 billion) produced the worst average returns, down 20.5%, while the category of smallest endowments (less than $25 million) fared best, down 16.8%. Smaller endowments benefitted in part from their relatively larger allocations to fixed income. In addition to experiencing loss of value, certain universities found themselves in a liquidity squeeze due to significant percentages of assets locked up in private, illiquid investments. In some instances, universities resorted to raising funds in the debt markets to make their required distributions rather than selling securities at distressed prices. As economic conditions improved in fiscal 2010, endowments overall gained 11.9%, with little variance among the size categories, and in fiscal 2011 they provided an average return of 19.8%, also with tight dispersion (Commonfund, 2011).

Academic research on university endowment performance has examined the relative sources of return from strategic (or long-term) asset allocation and from active management strategies involving specific security selections and market timing. Active
management strategies are pursued with the goal of outperforming the index (or passive) returns from the strategic asset allocation. The investment committee typically establishes the strategic asset allocation (sometimes with final approval by the university’s governing board) while investment managers hired by the university, whether external or internal, typically make decisions regarding specific security selection and the timing of investments.

Endowment researchers (Brown, Garlappi, & Tiu, 2007) have corroborated findings of other investment researchers that asset allocation has the largest influence on portfolio returns over time (Brinson, Hood, & Beebower, 1986; Ibbotson & Kaplan, 2000) while security selection explains a larger portion of performance variance in the cross-section of portfolios (Ibbotson & Kaplan, 2000; Kritzman, & Page, 2003). Undoubtedly, certain timeframes are noted for extraordinary returns from particular asset classes. For example, hedge funds contributed importantly to risk-adjusted returns over the 1984-2005 period of the study by Brown et al. (2007). Those authors also found in a 2010 study that top-performing endowment teams tend to allocate relatively larger portions of their portfolios to asset classes where their managers have superior security selection skills. Lerner, Schoar and Wongsunwai (2007) found that top-performing endowments had exceptional abilities in selecting successful venture capital partners. And in a related study, Lerner et al. (2008) suggest three primary explanations for superior endowment performance over the 1994-2005 timeframe: access to top money managers, or “a seat at the table,” particularly with regard to alternative asset class managers; greater experience of investment staff at top performers; and favorable conditions for alternative investments over the study period.
Composition and Role of Investment Committee

The investment committee is considered one of the most important committees of the university board of trustees because of its governance responsibilities related to the management of the endowment and other institutional pools of capital (Yoder, 2011). At private colleges and universities the investment committee is typically part of the governing board’s structure whereas at public universities it is usually part of the board structure of an institutionally related foundation (Yoder, 2011).

According to the 2009 NACUBO-Commonfund Study, the average number of voting members on the committee is 8.1, and more than 80% are drawn from the board of trustees. On average, about half of committee members are investment professionals, about half are alumni and about 35% are MBAs, CPAs or CFAs. Larger endowments have a larger percentage of members with professional investment experience and business credentials than smaller endowments.

The investment committee’s responsibilities fall generally under two main categories: that of developing a sound investment policy and that of ensuring that it is implemented efficiently and effectively (Yoder, 2011). The institution’s investment policy statement typically establishes the types of investments, or asset classes, which are acceptable in the portfolio, as well as the targeted percentage (and allowable range around it) each asset class will comprise in the overall portfolio. As noted, this asset allocation (including the acceptable ranges) is often referred to as the strategic or policy asset allocation and generally is developed with a long-term horizon. Other purposes of the policy statement are to establish return (or performance) objectives, acceptable risk levels and strategies for risk management, provisions for rebalancing the portfolio, and
specifications of benchmarks for each asset class and for the overall portfolio. The committee typically is charged with policy implementation, which includes selecting investment managers for specific asset classes or investment approaches, whether in-house or external, and monitoring managers’ performance and adherence to policy. Often, the committee hires an investment consulting firm to assist in the screening and monitoring of those managers. In addition, the committee usually plays a key role in the establishment of the spending (or distribution) policy of funds coming out of the endowment, and in monitoring investment-related expenses.

As described by the late Yale economist James Tobin, endowment fiduciaries are charged with preserving equity among generations (Commonfund Institute, 2001). This means ensuring that future generations can benefit from the endowment at least as much as the current beneficiaries. For example, if current distributions out of the endowment are too large, future generations will be short-changed. Similarly, very small current distributions may be too focused on the future at the expense of the present.

The vast majority of endowments operate under guidelines of the Uniform Prudent Management of Institutional Funds Act (UPMIFA) (Uniform Law Commission, 2006), drafted by the National Conference of Commissioners on Uniform State Laws and adopted by 48 states as of mid-2011. UPMIFA provides guidance and authority to charitable organizations that are intended to help preserve the endowment for the long term. Among the provisions are limitations on the size of annual withdrawals and a mandate to diversify the portfolio, although no specifics are provided regarding which asset classes must be included or the degree of diversification. Instead, UPMIFA adheres the requirement of “reasonable care, skill, and caution” as described in the Uniform
Prudent Investor Act (UPIA). The latter act, written in 1994, warned against the risks of having too much concentration of equities in a certain industry and did not address more recent considerations of diversification across a variety of asset classes. In sum, while legislation requires reasonable care and a level of diversification expected of prudent investors, it is up to the fiduciaries of each endowment/fund to interpret the laws and establish an appropriate degree of diversification.

Although the investment committee is composed largely of volunteers and typically meets only a few times a year, its decisions have enormous impact. Absolute portfolio performance is typically dissected into the contributions stemming from asset allocation, the specific investments within each asset class, and the timing of shifts between asset classes that is often referred to as market timing (Swensen, 2009). As noted, the endowment committee has significant influence over the overall asset allocation, setting allocation ranges for each asset class, and much less direct influence, if any, over the specific securities and timing of transactions. Those latter functions are typically carried out by external investment managers or, in the case of certain large endowments, by the in-house investment office for part of the portfolio.

Asset allocation has been found in numerous studies to be the largest determinant of performance variance over time (Brinson et al., 1986; Ibbotson & Kaplan, 2000). Thus, the committee typically makes the decisions that will have the most effect on absolute performance over time. For example, an all-equity portfolio would be expected to outperform a fixed-income portfolio over lengthy periods and the former would have far greater volatility than the latter. A fixed-income portfolio would be expected to be more stable but provide lower returns. Institutions’ goals and needs may differ
significantly and thus it is inappropriate to compare the absolute performance of institutions with very different objectives. Those that require very little in annual distributions but want capital appreciation to fund projects well into the future may want a more aggressive, growth-oriented portfolio. Other institutions that require more sizable annual distributions (or spending) from the endowment would likely make a much larger allocation to fixed-income investments.

In order to make “fair” comparisons between institutions, absolute performance numbers need to be adjusted to account for the risk, or volatility, that accompanied the returns. This can be done by taking the annualized return of a portfolio over a specified period and dividing it by the standard deviation of the annual returns over the full measurement period. (The popular Sharpe Ratio, used to assess money managers, is a type of risk-adjusted measurement.) The resulting risk-adjusted return is a measure of return per unit of risk that provides an apples-to-apples comparison across various portfolios.

According to Modern Portfolio Theory, diversification into multiple asset classes that are poorly correlated provides the means to either improve the absolute level of return for a specified level of volatility or to lower the portfolio’s volatility for a given level of return. Thus, portfolios with higher risk-adjusted returns are considered more efficient. Since the committee establishes the portfolio’s asset allocation, and, therefore, the degree of portfolio diversification, it also has a large influence on risk-adjusted returns. Managing volatility is particularly important at endowments that have ongoing withdrawals, since volatility can affect both the level of withdrawals and the portfolio value over time (Yoder, 2004).
The committee’s abilities in hiring outside managers is extremely important since about 93% of endowment assets are managed by external firms (NACUBO, 2008); that percentage is even larger for the smallest endowments, 96%, and somewhat smaller for the large endowments with assets over $1 billion, 92%. At about three-quarters of university endowments the committee is responsible for the hiring and firing of managers (NACUBO, 2008) although investment consultants may conduct initial screens and due diligence. Investment strategies within each asset class may be either passive (invested in index-based vehicles) or active (which attempt to outperform the indices). While about 18% of overall endowments are passively managed, it varies by size. The category of smallest endowments use passive strategies for 27% of their portfolios while the category of largest endowments use passive strategies for only 7.4% (NACUBO, 2008). Committees thus may provide additional value in using active strategies in asset classes for which they are adept at selecting superior managers; overweighting those strategies may provide further benefits assuming the portfolio’s risk exposure is appropriate.

In sum, committees’ asset allocation decisions have an enormous impact on both the absolute and risk-adjusted returns over time; in addition, their ability to hire managers with superior security-selection skills may explain a significant portion of performance variance among endowments. While recognizing the importance of manager selection, this study is focused exclusively on the committee’s portfolio diversification decisions as an outcome of committee processes and competence.
CHAPTER II: PORTFOLIO DIVERSIFICATION FACTORS

Given the paucity of research on group decision-making for investment portfolios, it is instructive to review literature regarding individual investment behavior for insights about portfolio construction and diversification. A considerable body of literature on human cognition and decision-making is also relevant to this discussion. Below, I will discuss a number of concepts with particular relevance to investors’ lack of diversification in their portfolios, followed by research findings that pertain specifically to university endowments.

Economic utility theory holds that individuals are rational and that they make wealth-maximizing decisions (Von Neumann & Morgenstern, 1947). However, substantial literature can be cited to demonstrate investor behavior that is neither rational nor wealth-maximizing. A well-documented type of familiarity bias among investors, called home bias, describes the tendency to overweight holdings of domestic equities relative to foreign equities (French & Poterba, 1991). A partial explanation is that investors generally have more optimistic expectations about stocks in their own country and more pessimistic expectations about foreign stocks (Kilka, 2000; Shiller, Konya, & Tsutsui, 1991; Strong & Xu, 1999). This preference for the familiar extends beyond national distinctions: investors also tend to hold disproportionately large positions in companies located close to them and in their own employers’ stock. Investors typically overweight these familiar companies without analyzing their investment fundamentals or ramifications for the overall portfolio.

Familiarity bias among investors is also manifested by a phenomenon called “the endowment effect,” which refers to their tendency to value their existing holdings more
highly than comparable investments they do not own (Thaler, 1980). The endowment
effect helps to explain people’s reluctance to part with their existing holdings: they
demonstrate this by requiring a much higher price to sell something they already own
than what they would be willing to pay for something that could objectively be
considered to have similar value. This tendency contributes to investor inertia, or a
preference for the status quo (Kahneman, Knetsch, & Thaler, 1991). Status quo bias is a
manifestation of loss aversion in which individuals consider the disadvantages of giving
up something far greater than the possible advantages derived from making new
acquisitions. The status quo is the reference point against which gains and losses are
measured, and losses are weighted more heavily than gains (Tversky & Kahneman,
1991). As a result, poorly diversified portfolios tend to remain so.

Researchers have found that investors believe that unfamiliar investments carry
greater risks than familiar investments; investors simply needed to recognize the name of
the investment in order for it to be considered familiar and less risky (Weber,
Siebenmorgen, & Weber, 2005). Thus, without any investment-related assessment,
companies whose names were not recognized were assumed to be riskier than companies
whose names were recognized. A survey by John Hancock-Gallup demonstrates the
linkage between familiarity bias and risk perceptions (Driscoll, Malcolm, Sirul, & Slotter,
1995). Researchers found that 401(k) participants: a) consider their employer’s stock
safer than a diversified domestic stock fund, and b) consider a domestic stock fund safer
than an international stock fund. In short, investors’ irrational risk perceptions interact
with familiarity bias to inhibit portfolio diversification.
Another factor that affects risk perceptions is called narrow framing (Kahneman & Lovallo, 1993). This refers to human tendencies to evaluate one investment at a time, focusing on its individual characteristics, rather than considering the characteristics of the overall portfolio. Narrow framing can result in an extreme unwillingness to take risks, because the investor overlooks the ability for multiple types of investments to provide risk pooling. Another concept described by Kahneman and Lovallo (1993) that helps to explain faulty risk perceptions is referred to as having an inside view rather than an outside view. An inside view involves knowing considerable details about a situation or investment and typically includes optimistic expectations. In contrast, an outside view considers statistics about the probability and the nature of various outcomes. Having an inside view may be associated with overconfidence and a tendency to undervalue factors with which one is relatively ignorant (Kahneman & Tversky, 1979).

All of these concepts help to explain investors’ tendencies to under-diversify their portfolios. Typically, investors are more optimistic about investments they have some familiarity with and they consider unfamiliar investments to be riskier. They consider the investments they already own to be significantly more valuable than those they do not own. And they tend to look at each investment in isolation rather than as part of a whole; therefore, they do not appreciate the beneficial effects of risk pooling.

Unfortunately, poorly diversified portfolios produce inferior results for typical investors. Goetzmann and Kumar (2008) found that investors with the most diversified portfolios in 401(k) plans enjoyed annualized returns that averaged 2.4% higher than those with the least diversified portfolios. In addition, investors who believe they can
pick big winners may have highly concentrated portfolios that incur significant losses when their “stars” turn into storms.

A number of researchers have examined investor sophistication and behavior. Kimball and Shumway (2007) found that higher levels of investor sophistication are correlated with less home bias and greater diversification. They measured investor sophistication by their level of education, extent of reading about investing, and regularity in meeting with investment professionals. Research by Goetzmann and Kumar (2008) produced similar findings and research by Graham, Harvey and Huang (2009) found a relationship between investors’ perception of their competence and portfolio diversification.

With regards to university endowments, a recent study by Brown et al. (2011) found that investment committee members’ experience on other boards and their business background are correlated with the degree of diversification of the endowment portfolio. This research, therefore, appears to extend the link between investor sophistication and portfolio diversification at the individual level to that of a group level.

Other endowment-related research has shown that endowment performance is highly correlated with endowment size and the academic quality of the student body, as measured by SAT scores (Lerner et al., 2008). The authors suggest that larger endowments are able to pay more for skilled investment managers than smaller endowments. They also suggest that SAT scores may be a proxy for the overall skill of the university’s administration, the wealth and connections of the alumni, and the prestige of the university brand. Since committee members are often drawn from alumni, their
academic abilities may contribute to better decision-making processes and outcomes
(Lerner, et al., 2008).

Therefore, while research has substantiated a link between investor sophistication
and diversification, there exists a notable gap regarding group norms and processes that
would influence portfolio diversification. Such research would attempt to identify factors
that would help to eliminate familiarity bias, endowment effects, irrational risk
perceptions and narrow framing. My three research papers contained in this dissertation
are focused on identifying and examining the effects of such factors.
CHAPTER III: ABSORPTIVE CAPACITY, LEARNING ORIENTATION AND INSTITUTIONAL INVESTMENT PERFORMANCE

Introduction

Although references to the absorptive capacity (ACAP) construct have grown dramatically in organizational research over the past two decades, important gaps remain in identifying intra-organizational antecedents of ACAP and outcomes of ACAP exploitation (Volberda, Foss, & Lyles, 2010). In addition, domains for examining the ACAP construct remain limited, with concentrations persisting in the areas of information systems and innovation (Lane, Koka, & Pathak, 2006; Van Wijk, Van Den Bosch, & Volberda, 2011). This study hypothesizes new ACAP antecedents and outcomes in an unexplored domain, that of institutional money management, and specifically in the realm of university endowments. With the endowment's investment committee as the unit of analysis, we examine how prior experience and group norms that reflect a learning orientation contribute to ACAP, and how ACAP helps to explain portfolio diversification and risk-adjusted performance. We focus on the investment committee, consisting largely of volunteers who meet several times a year, since it is the body that typically establishes the asset allocation policy of university endowments (National Association of College and University Business Officers (NACUBO, 2008).

Understanding factors that contribute to investment portfolio performance is critical for college and university leaders since endowment returns can profoundly affect the amount of student financial aid, administrative staff size, facilities maintenance, programming, and mix of tenure-track and adjunct faculty (Brown, Garlappi, & Tiu, 2010). Investment performance of university endowments has taken on added
significance due to the recent recession-related declines in financial markets, donor giving and state allocations to higher education (Ehrenberg, 2009). Distributions from endowments now make up a larger share of university budgets than ever recorded (Brown et al., 2011) and universities increasingly emphasize the importance of both donor giving and endowment performance.

Annual industry studies by NACUBO (2002-2008), and more recently by NACUBO and the Commonfund Institute jointly (2009-2010), have documented that larger endowments have greater portfolio diversification and superior long-term performance than smaller endowments. The ability of well-diversified portfolios to produce superior risk-adjusted returns relative to poorly-diversified portfolios has been well established by Modern Portfolio Theory (Markowitz, 1952, 1959), yet examples of poor diversification are plentiful both in individual and institutional portfolios. These often take the form of very heavy concentrations in 1-3 asset classes and essentially no exposure to any others. While smaller university endowments typically are less diversified across asset classes than larger ones, significant disparities in diversification exist among endowments of similar size and even among very large endowments (NACUBO, 2002-2008). Studies in behavioral finance have explored investor characteristics and behaviors that affect asset allocations of individual portfolios (Barber & Odean, 2008; Goetzmann & Kumar, 2008; Kahneman & Tversky, 2000; Statman, 2010; Thaler, 2005), yet relatively little research has examined group characteristics and processes that may affect the allocation, and thus the degree of diversification, of institutional portfolios such as pensions and endowments.
Absorptive capacity is considered similar in many ways to organizational learning in that both involve learning processes of knowledge acquisition and utilization. In conceptualizing absorptive capacity, Cohen and Levinthal (1989, 1990) referred to it as a “learning capacity” that consists of recognizing the value of external information, assimilating it with existing knowledge and exploiting the expanded knowledge for commercial benefit. Researchers generally agree that ACAP is a multi-dimensional construct, but they have theorized and operationalized the construct with varying numbers of dimensions and varying measurement scales for each dimension (Lane et al., 2006; Van Wijk et al., 2011; Volberda et al., 2010).

Zahra and George (2002) re-conceptualized the construct as having two primary components or dimensions, potential and realized, with “potential” ACAP or PAC consisting of knowledge acquisition and assimilation, and “realized” ACAP or RAC consisting of knowledge transformation and exploitation. We apply the broader two-dimensional depiction of ACAP, thus collapsing the two PAC sub-dimensions and the two RAC sub-dimensions, and argue that PAC serves as an antecedent of RAC. Both components are important for organizational performance: university endowment committees not only need to be able to acquire knowledge that is relevant to portfolio construction, they must also be able to implement it successfully.

Absorptive capacity has been tied to various measures of organizational performance such as patents, R&D investments, knowledge transfer and innovation (Volberda et al., 2010), but this study is the first to hypothesize its linkage to institutional investment performance. We argue that the committee’s realized absorptive capacity, or
knowledge exploitation, will contribute to risk-adjusted investment performance indirectly through the degree of diversification that is implemented in the portfolio.

With regards to antecedents of absorptive capacity, “prior related knowledge” is considered essential since it allows for faster absorption or assimilation of new external information (Cohen & Levinthal, 1990). Those authors, as well as others who study group learning and decision-making, emphasize the importance of knowledge gained from multiple perspectives in contributing to decision quality and performance (Milliken & Martins, 1996). Based on our field research we develop a scale for prior related knowledge that captures the committee’s investment expertise across different asset classes, or types of investments. Thus, it addresses aspects of both depth and breadth of knowledge (Carlo, Lyytinen, & Rose, 2011) of the group, or, stated differently, richness and diversity (Van Wijk et al., 2011).

A few studies have explored other antecedents to ACAP, and particularly structural factors such as combinative and systems capabilities (Jansen, Van Den Bosch, & Volberda, 2005; Kogut & Zander, 1996) and organizational structure (Cohen & Levinthal, 1990, Van den Bosch, Volberda, & de Boer, 1999). However, despite the fact that absorptive capacity is considered both a cognitive and social construct, we find the lack of empirical examination of social context and group norms that may influence ACAP as quite surprising. The research by Jansen et al. (2005) perhaps has come closest in examining how socialization capabilities that include information sharing and new-member indoctrination affect certain ACAP dimensions. In a related field of intellectual capital, researchers have argued that social capital, such as networks of relationships in an organization, contribute to knowledge development (Nahapiet & Ghoshal, 1998). We
travel further to the field of marketing research to borrow a second-order factor called learning orientation (Sinkula, Baker, & Noordewier, 1997) -- consisting of shared vision, learning commitment and open-mindedness -- as a candidate for group norms that influence absorptive capacity. Collectively, these factors capture a group’s commitment to common goals, to the value of learning, and to the importance of open dialogue.

In sum, this study has four primary objectives: 1) to provide insights as to how absorptive capacity contributes to better outcomes in a governance, decision-making setting, specifically that of university endowment committees; b) to test the effectiveness of decision-making groups’ learning orientation in augmenting absorptive capacity; c) to supplement empirical studies of absorptive capacity as a two-dimensional construct with “potential” ACAP serving as an antecedent to “realized” ACAP; and, d) to add to existing research that explains how group composition -- including both depth and breadth of knowledge -- contributes to absorptive capacity.

In the following section we will formalize our hypotheses by examining research on absorptive capacity and learning orientation, and by integrating it with other research streams from organizational learning, knowledge management and finance. Following extensive qualitative field research, our empirical study is based on a survey of “key informants” at 168 U.S. university endowments, with objective performance data drawn from annual industry surveys.

**Theory and Hypotheses**

**Absorptive Capacity and Prior Related Knowledge**

Absorptive capacity (ACAP) is a learning capacity that encompasses the ability to identify and acquire external knowledge that is relevant to the organization’s purpose, to
assimilate the new knowledge with existing knowledge, and to apply or exploit the expanded knowledge for commercial benefit (Cohen & Levinthal, 1990). ACAP has also been characterized as a knowledge process (Lane et al., 2006). Knowledge, in turn, has been proposed as a key resource of the firm (or organization) and a primary source of competitive advantage (Barney, 1991; Grant, 1996; Kogut & Zander, 1996). The components of the ACAP framework overlap to varying degrees with other theoretical frameworks including organizational learning, knowledge management, and dynamic capabilities (Vera, Crossan, & Apaydin, 2011). All of them involve the development of greater organizational knowledge and competencies, as well as processes toward that end.

Organizational learning has been defined as a process of improving organizational actions through better knowledge and understanding (Fiol & Lyles, 1985; Garvin, 1993). Similarly, learning can facilitate the discovery of superior knowledge and a focused inquiry into how the results of “best practices” can be obtained and transferred (Szulanski, 1996). Organizational learning researchers have addressed cognitive types of learning (Argyris, 1999; Kolb, 1984) as well as learning processes (Huber, 1991; Levitt & March, 1988; Tippins & Sohi, 2003). Knowledge management has been defined as “the process of creating, capturing, and using knowledge to enhance organizational performance” (Bassi, 1999) and focuses more on managing what is learned rather than on the processes of learning that are emphasized in organizational learning (Argote, 2005). The dynamic capabilities framework, developed by Teece, Pisano and Shuen (1997), refers to the “capacity to renew competences so as to achieve congruence with the changing business environment…” Their framework, while encompassing knowledge
acquisition and utilization, focuses on flexible competencies in rapidly changing environments.

While Cohen and Levinthal’s three-dimensional depiction of ACAP (consisting of knowledge identification, assimilation and exploitation) is preferred by certain researchers (Lane et al., 2006; Todorova & Durisin, 2007), others have followed the re-conceptualization proposed by Zahra and George (2002) that consists of two primary dimensions: potential absorptive capacity (PAC) and realized absorptive capacity (RAC). Zahra and George (2002) maintain that PAC consists of acquisition and assimilation of new external knowledge while RAC consists of knowledge transformation and exploitation. The PAC and RAC dimensions bear similarities to the paired learning mechanisms of organizational search and experimentation (Carlo et al., 2011; Eastburn, Boland, & Lyytinen, 2011; Levitt & March, 1988); reflection and action (Edmonson, 1999); and exploration and exploitation (March, 1991). This two-dimensional learning approach also resembles the differentiation between “know what” with its emphasis on obtaining factual information and “know how” which is derived largely from experience (Kogut & Zander, 1992).

In all of these variations, the first process relates strongly to the acquisition of new knowledge whereas the second involves the application of the expanded knowledge (Van Wijk et al., 2011). We apply this broad-brush distinction in our operationalization of PAC and RAC, while recognizing that knowledge assimilation occurs alongside acquisition in the first process and that transformation and exploitation are encompassed in the second process of successful application that occurs with heightened capabilities. The structural aspect of learning posits that an organization’s ability to implement
behaviors is suggested by the wisdom it accumulates (Garvin, 1993). PAC and RAC are both essential in improving organizational performance: knowledge cannot be exploited without first acquiring and assimilating it, yet simply having the knowledge does not guarantee that it will be exploited beneficially (Zahra & George, 2002). PAC and RAC have been found to be empirically distinct capabilities (Camisón & Forés, 2010) and thus may have different antecedents and outcomes.

The ability to evaluate and utilize external knowledge is largely a function of prior related knowledge since pre-existing knowledge increases the capability of both putting new knowledge into memory and using it upon recall (Cohen & Levinthal, 1990). An organization’s base of knowledge permits it to recognize new developments and opportunities in the environment (Tilton, 1971). While Cohen and Levinthal discuss the importance of related knowledge, they also emphasize the importance of knowledge diversity. Thus, the concept of prior related knowledge may consist of dimensions related to knowledge diversity, knowledge depth and knowledge linkages with external actors (Carlo et al., 2011). Grant (1996) considers “the fundamental task of organizations” to be the coordination of the efforts of individualized specialists toward efficient knowledge production.

Researchers have found that knowledge from multiple perspectives leads to improved decision quality (Amason, 1996; Morrison, 1992), greater ability to access and absorb new knowledge (Zahra & George, 2002; Milliken & Martins, 1996; Forbes & Milliken, 1999; Wadhwa & Kotha, 2006); greater flexibility and adaptability to environmental change, (Lewin & Volberda, 1999); increased creativity (Hoffman & Maier, 1961); greater innovation (Cohen & Levinthal, 1990); greater experimentation
(Carlo et al., 2011) and stronger performance (Horwitz & Horwitz, 2007; Jackson, Joshi, & Erhardt, 2003). An important aspect of organizational learning consists of adding new members with knowledge that the group previously did not possess (Simon, 1991).

In our setting of endowment investment management we have adapted the “prior related knowledge” construct to capture the committee’s degree of expertise in a broad range of investment asset classes such as domestic and international equities, fixed income, hedge funds, private equity, real estate and natural resources. This incorporates both the depth of investment expertise as well as the breadth across multiple asset classes. Just as prior related knowledge is viewed as an antecedent to ACAP in other domains, we argue that the committee’s existing expertise across multiple asset classes increases its ability to both acquire relevant external information about various investments and to exploit it.

Thus, incorporating the antecedent of prior related knowledge, which we refer to as Diverse Investment Expertise (DE), along with the PAC and RAC dimensions of absorptive capacity, we hypothesize as follows:

Hypothesis 1. Potential Absorptive Capacity will partially mediate the effect of Diverse Investment Expertise on Realized Absorptive Capacity.

The above mediation hypothesis consists of the following:

Hypothesis 1a. Diverse Investment Expertise will have a significant positive effect on Potential Absorptive Capacity.

Hypothesis 1b. Diverse Investment Expertise will have a significant positive effect on Realized Absorptive Capacity.

Hypothesis 1c. Potential Absorptive Capacity will have a significant positive effect on Realized Absorptive Capacity.
Learning Orientation

Learning orientation is a set of organizational norms that influence the organization’s propensity to seek and use knowledge (Sinkula et al., 1997). Galer and van der Heijden (1992) maintain that a “culture amenable to learning” is necessary for understanding changes in the organization’s environment. Learning orientation has been employed in marketing research as a second-order factor consisting of the following first-order factors: 1) shared vision; 2) learning commitment; and 3) open-mindedness (Sinkula et al., 1997). Organizations with a learning orientation have a sense of direction for their learning as well as a critical-assessment approach that encourages open debates and questioning of assumptions (Slater & Narver, 1995). While learning commitment and open-mindedness influence the intensity of learning, shared vision is vital in providing direction, thus reducing ambiguity about expectations, operational theories and outcomes measurement (Sinkula et al., 1997).

In empirical studies, a greater learning orientation has led to greater information acquisition and dissemination (Sinkula et al., 1997) and greater product innovation and performance (Calantone, Cavusgil, & Zhao, 2002). Learning orientation has been employed in other domains as a single first-order factor that captures the organization’s emphasis on learning (Bunderson & Sutcliffe, 2003; Eastburn et al., 2011; Schilling, 2002), with similarities to the “learning commitment” first-order factor mentioned above. We adopt the second-order factor employed by Sinkula et al. and discuss each of the first-order factors below.
Shared Vision

Pearce and Ensley (2004) define shared vision as “a common model of the future state of the team or its tasks that provides the basis for action within the team.” It is considered critical for proactive learning because it increases organizational focus and fosters energy, commitment and purpose among organizational members (Day, 1994; Tobin, 1993). An organization’s shared vision is a manifestation of the cognitive dimension of social capital that leads to trust and resource sharing (Tsai & Ghoshal, 1998). Senge (1990) states that learning cannot occur without shared vision since it provides the “pull” toward goals that helps to overcome forces of inertia. The shared vision, or set of core beliefs, helps to legitimize the acquisition and assessment of new knowledge (Lyles & Salk, 1996).

Learning Commitment

Organizations’ commitment to learning reflects the value they place on understanding the causes and effects of their actions (Shaw & Perkins, 1991). It is linked to intensity of effort, or the amount of energy expended by organizational members toward solving problems and developing absorptive capacity (Cohen & Levinthal, 1990; Kim, 1998). In addition, investments in learning are important in keeping organizations from becoming overly reliant on an aging knowledge base that may become obsolescent (Schilling, 2002).

Learning commitment is related to Senge’s (1990) learning principles and Tobin’s (1993) expression of “thinking literacy.” As stated by Senge (1990), “The organizations that will truly excel in the future will be the organizations that discover how to tap people’s commitment and capacity to learn at all levels in an organization.” Financial
officers at top-performing endowments have reported that investment committees engage in intensive educational sessions about asset classes not previously held in the portfolio before feeling comfortable about making investments in them (Kochard & Rittereiser, 2008).

Open-mindedness

Open-mindedness is the ability of the organization to question members’ biases and assumptions, and to be open to new approaches (Calantone et al., 2002). Individuals’ mental models, which are deeply held beliefs or images of how things work, limit them to familiar ways of thinking and behaving (Day & Nedungadi, 1994; Sinkula et al., 1997). Over time, these models may lose their efficacy if they are not questioned and altered (Day, 1994; Sinkula, 1994). High-performing organizations may benefit from a relatively high level of disagreement as a result of closer inspection of assumptions and alternatives (Janis, 1972; Jehn, 1995; Slater & Narver, 1995). Thus, open-mindedness is related to cognitive conflict in which diverse perspectives are debated through such techniques as devil’s advocacy and dialectical inquiry, resulting in higher-quality decisions (Amason, 1996). The process of synthesizing diverse perspectives of team members is considered superior to the individual perspectives alone (Mason & Mitroff, 1981; Schweiger & Sandberg, 1989).

Open-mindedness could be expected to illuminate and mitigate committee characteristics that limit portfolio diversification. Examples of such characteristics for individual investors include narrow framing of investment decisions (Barberis, Huang, & Thaler, 2006; Kahneman & Lovatto, 1993; Kumar & Lim, 2008); irrational risk perceptions (Sjoberg, 2000; Weber et al., 2005) and a preference for familiar investments
called “home bias” or “domain familiarity” (Graham et al., 2009; Jemison & Sitkin, 1986; Tversky & Kahneman, 1973). University financial officers interviewed in our qualitative study (Lord, 2010) stressed the importance of vigorous debate among endowment team members in order to avoid “groupthink” and situations where a dominant personality could otherwise have undue influence on decisions. Open debates also help committee members understand others’ perceptions of the potential risks and returns of various investments and the role of portfolio diversification (Kochard et al., 2008).

In keeping with prior research that has documented how a learning orientation contributes to learning processes, and how learning processes resemble ACAP dimensions, we hypothesize the following:

**Hypothesis 2.** Potential Absorptive Capacity will partially mediate the effect of Learning Orientation on Realized Absorptive Capacity.

The above mediation hypothesis consists of the following:

**Hypothesis 2a.** Learning Orientation will have a significant positive effect on Potential Absorptive Capacity.

**Hypothesis 2b.** Learning Orientation will have a significant positive effect on Realized Absorptive Capacity.

**Hypothesis 2c.** Potential Absorptive Capacity will have a significant positive effect on RAC (same as H1c).

**Portfolio Diversification and Investor Sophistication**

Starting with Harry Markowitz in the early 1950s, studies in finance have demonstrated how diversified investment portfolios contribute to higher risk-adjusted performance (Elton, Gruber, Brown, & Goetzmann, 2010; Fabozzi, Kolm, Pachamanova, & Focardi, 2007; Markowitz, 1952, 1959; Rubenstein, 2006). The popular definition of
diversification is expressed as “not putting all your eggs in one basket” and the mechanism for the benefits of diversification is that of combining assets with “less-than-perfect positive correlation” of returns (Francis, 2010). The trend toward broader diversification of endowment portfolios is grounded in Modern Portfolio Theory (Markowitz, 1952, 1959), more recently referred to simply as Portfolio Theory. The theory, based on mean-variance analysis, provides a framework for constructing portfolios that balances the twin goals of performance and risk management. Specifically, the theory posits that diversification promotes efficient portfolios that either: a) provide greater returns given a specified risk level; or b) reduce risk for a specified level of return. The measurement of risk-adjusted returns, which consists of absolute returns adjusted for volatility, permits comparisons between portfolios regardless of the targeted goals.

Research on individual investors substantiates the link between investor “sophistication” and degree of diversification in portfolios of individual stocks (Goetzmann & Kumar, 2008). The authors found that greater diversification (lower correlations of returns among the stocks) was significantly and positively related to investors’ age, income, education, occupation type (professional vs. non-professional) and experience. Another study found a significant relationship between investors’ perceptions of their “competence” and the degree of diversification attained by including international equities in their portfolios (Graham et al., 2009). Competence was measured by investors’ perceptions about their “ability to understand investment products, alternatives, and opportunities” (Graham et al., 2009: 1096), and the perceptual
measure of competence was found to be significantly and positively related to degree of
education, wealth and the male gender.

In a very recent study focusing specifically on the composition of endowment
investment committees (Brown et al., 2011), portfolio allocations to alternative asset
classes (including hedge funds, venture capital, private equity and natural resources) were
significantly correlated with committee members’ experience on other boards or in
executive positions (types of boards or executive experience were not specified).

In sum, these findings provide support for the view that both experience and
perceived competence, which is strongly related to “realized” absorptive capacity,
influence the degree of diversification held in portfolios relative to endowments of
similar size. We hypothesize as follows:

*Hypothesis 3. Realized Absorptive Capacity will partially mediate the effect of
Diverse Investment Expertise on Relative Portfolio Diversification.*

The above mediation hypothesis consists of the following:

*Hypothesis 3a. Diverse Investment Expertise will have a positive effect on
Realized Absorptive Capacity.*

*Hypothesis 3b. Diverse Investment Expertise will have a positive effect on
Relative Portfolio Diversification.*

*Hypothesis 3c. Realized Absorptive Capacity will have a positive effect on
Relative Portfolio Diversification.*

**Risk-Adjusted Performance**

As noted previously, greater portfolio diversification is correlated with higher
risk-adjusted performance, or performance that takes variance of returns into
consideration (Elton et al., 2010; Fabozzi et al., 2007; Markowitz, 1952, 1959;
Rubenstein, 2006). Also discussed previously, research has demonstrated a significant
relationship between individual investors’ perceived competence and portfolio
diversification (Graham et al., 2009). In many aspects, RAC resembles perceived
competence in that the RAC construct captures perceptions of committees’ ability to
analyze, assess and capitalize on investment knowledge. In addition to asset allocation,
other sources of investment performance involve the selection of specific investments
within asset classes and the timing of investment transactions (Brown et al., 2007, 2010;
Kritzman & Page, 2003). While investment committees are largely responsible for asset
allocation, hired investment managers rather than the investment committee typically
perform those latter functions. We do not hypothesize a significant direct effect of RAC
on performance since we believe the effect is indirect, occurring via the committee’s
decisions regarding asset allocations (and possibly via their selection of investment
managers and consultants, factors that are not measured in this study). Our study
examines both portfolio diversification and risk-adjusted returns on a relative basis—
comparing data from individual endowments to the average level for their size category.

We hypothesize as follows:

Hypothesis 4. Realized Absorptive Capacity will have an indirect effect on
Relative Risk-Adjusted Returns through Relative Portfolio Diversification.

The hypothesis consists of the following:

Hypothesis 4a. Realized Absorptive Capacity will have a positive effect on
Relative Portfolio Diversification.

Hypothesis 4b. Relative Portfolio Diversification will have a positive effect on
Relative Risk-Adjusted Returns.

Our model with hypotheses is provided in Figure 2.
Research Methods

Data Collection and Sample

Empirical data to test the hypothesized relationships were obtained by an electronic survey. Emails soliciting participation were sent to 650 colleges and universities, all of which had participated in the 2009 NACUBO-Commonfund Endowment Survey and/or in previous annual surveys sponsored solely by NACUBO and for which five-year performance data through mid-2009 were available. Institutions that participate in the annual industry survey, the values of their endowment assets and
other data are available on NACUBO’s website, (http://www.nacubo.org/Research/NACUBO_Endowment_Study/Public_NCSE_Tables_.html). Emails were addressed to financial officers requesting survey participation by a “key informant:” someone who has regularly attended committee meetings for at least several years and is very knowledgeable about the committee’s responsibilities and decision-making practices, as well as the investment experience of committee members. The solicitation email suggested that either the university financial officer most involved with the endowment or the investment committee chair would be an ideal respondent. Three follow-up emails were sent in intervals of approximately 12 days during September and October, 2010.

A total of 191 colleges/universities responded to the survey; the usable number was reduced to 168, or 25.8%, after eliminating nine cases due to incomplete surveys, three outliers, and 11 institutions for which objective asset allocation data were not available from NACUBO studies. Sample size of 168 is considered adequate as it exceeds the minimum recommendation of five observations relative to the number of independent variables (Hair, Black, Babin, & Anderson, 2010). To determine if the sample was representative of all 650 colleges with five-year performance data in the 2009 NACUBO-Commonfund survey we conducted an independent samples t-test of the means of the five-year annualized returns. No significant difference was observed between the means (t=0.44; df=826; p>.05). The mean return from the NACUBO-Commonfund study was 2.7%, s=2.8%, while the mean of this sample was 2.6%; s=2.1%.
Data in Appendix A indicate that all but four respondents were finance, foundation, or investment officers; two were outsourced Chief Investment Officers and two were investment committee members. On average, respondents have served 11 years in an endowment-related role with the college/university. Respondents were from both public (39%) and private (61%) institutions and the size of endowments spanned all six categories in the annual NACUBO-Commonfund study, from less than $25 million to greater than $1 billion. The average endowment size of survey participants as of fiscal year-end 2009 was $315 million, compared to $306 million in the 2009 NACUBO-Commonfund study.

The investment committees in our sample play important roles in key decisions concerning the management of the portfolio: 68% of respondents indicated that the committee makes final decisions about hiring/firing managers and 67% said the committee makes the final decision about hiring/firing consultants. Sixty-three percent of respondents indicated that the investment committee made the final decisions regarding policy asset allocations over the five-year measurement period, followed by the board of trustees/foundation, 34%; the latter body typically approves recommendations from the investment committee about asset allocations.

Measurement

The questionnaire included 26 items used in construct scales, provided in Appendix B. In addition, respondents were asked to provide their endowment’s five-year annualized total return, using the same number they provided in the 2009 NACUBO-Commonfund industry study; the performance data were corroborated via direct observation of that study’s results. Survey participants were instructed to base their
responses over the period covering mid-2004 to mid-2009. That timeframe was chosen since: 1) it contained different market environments with periods of both positive and negative endowment performance; 2) it covered a span in which the majority of survey recipients were expected to have been involved with the endowment; 3) it was sufficiently recent for participants’ recollection; and 4) it permitted a sufficient number of respondents with five-year performance data in order to conduct meaningful analysis.

**Independent Variables**

The scale items for the independent variables and the absorptive capacity variables employed a 7-point Likert scale ranging from Very Strongly Disagree to Very Strongly Agree. The three first-order factors reflecting Learning Orientation (learning commitment, open-mindedness, and shared vision) were adapted from existing scales (Calantone et al., 2002; Sinkula et al., 1997). Among the learning commitment items were: “The committee believed learning is a key commodity for long-term success” and “The committee was committed to learning about successful endowment practices.” Open-mindedness items included: “Committee members frequently questioned their biases about investing” and “The committee was not afraid to reflect critically on investment-related assumptions it made.” Among the shared vision items were: “Our committee was in agreement about the endowment’s purpose” and “Committee members were committed to the goals for the endowment.” Items for diverse committee expertise were informed by pre-testing with investment professionals and theory (Forbes & Milliken, 1999). Committee expertise items sought to identify whether members had expertise across a broad variety of investments including traditional and alternative asset classes, as well as public and private investments.
Absorptive Capacity

The absorptive capacity scales were developed and adapted from Zahra and George (2002), Jansen et al. (2005), Jaworski and Kohli, (1993), and Szulanski (1996). Items included: “The committee collected in-depth information that was relevant to our investment decisions,” and “The committee knew how to implement new investment knowledge.” The former is representative of items used in measuring information acquisition, a facet of potential absorptive capacity, whereas the latter is representative of information exploitation, a facet of realized absorptive capacity. As Zahra and George (2002) were the original researchers to re-conceptualize ACAP into the two separate constructs for potential and realized ACAP, we relied largely on their guidance for adapting items to represent the two constructs.

Relative Portfolio Diversification

Our measure of portfolio diversification seeks to control for size by asking for participants’ perception of their endowment’s degree of diversification relative to the average diversification of peers in their size category. Participants in the NACUBO-Commonfund study are able to view asset allocations of all participants as well as the average asset allocations for each size category. Supporting evidence of participants’ awareness of other endowments’ degree of diversification is based on an 86% affirmative answer to the following survey question: “Has the committee typically compared your institution with others in the NACUBO and/or Commonfund study over the past several years?” Of the 168 respondents in this study, 145 responded “yes,” 18 responded “no,” and five did not respond.
Three items were used to measure portfolio diversification relative to size peers over the recent 10-year, 5-year, and 1-year periods; response choices ranged from 1-significantly less diversified to 5-significantly more diversified. While we are primarily interested in the 5-year period, we included both a longer and shorter period for a fuller perspective. Committees rarely change their targeted asset allocations substantially from one year to the next, yet industry surveys have documented the steady, incremental march toward greater portfolio diversification, both on a total industry level and on the category size level (NACUBO, 2002-2008).

**Relative Risk-Adjusted-Returns**

In the survey we requested annualized total returns of endowments over 1, 3, 5, and 10-year periods ended fiscal 2009; the 5-year data used in this study were corroborated with data in the 2009 NACUBO-Commonfund Endowment Survey. To obtain risk-adjusted returns we divided the annualized 5-yr return by the standard deviation of the returns of the five component years: fiscal years 2005, 2006, 2007, 2008 and 2009. Since we were interested in factors other than endowment size that influence performance, we chose to measure universities’ performance relative to the average performance of peers in their own size category. Thus, in our model, both the diversification and performance variables are relative measures in that participating universities are compared to average scores of their size categories.

**Control Variable**

We controlled for the number of endowment staff with professional investment expertise it has been linked previously to investment performance (NACUBO, 2002-2008; Lerner et al., 2008).
Factor Analysis

Exploratory Factor Analysis (EFA) was conducted simultaneously with all items for the latent factors using Principal Axis Factoring with Promax rotation. Certain items with the weakest loadings were eliminated, including one item from each of the Diverse Expertise, Learning Commitment and Open-Mindedness scales. No survey items were eliminated for the Shared Vision and Relative Portfolio Diversification scales. The survey intentionally included a large number of potentially usable items (14) for Absorptive Capacity, borrowing from multiple prior studies, since the construct items have not become standardized in the literature. Six items were eliminated following the data collection due to weak loadings, cross-loadings on other constructs, or lack of adherence to either of the two dimensions of Potential Absorptive Capacity (PAC) and Realized Absorptive Capacity (RAC) as discussed by Zahra and George (2002). A six-factor model emerged from the extraction process with 26 items explaining 78.9% of total variance with eigenvalues set at >1. The pattern matrix, included in Appendix C, revealed all remaining 8 Absorptive Capacity items loading on one factor. Solving for additional factors did not result in a neat division between PAC and RAC items, as we expected, so we moved on to Confirmatory Factor Analysis (CFA) for more rigorous testing.

Using CFA we tested for the separate constructs of PAC and RAC based upon the conceptual distinction made by Zahra and George (2002). Thus, we conducted CFA of all seven latent factors to validate the factor structure and assess model fit, which was acceptable (cmin/df of 1.611, CFI of .958, PCFI of .796 and RMSEA of .060 with PCLOSE of .053). The CFA model is provided in Appendix D. Interestingly, certain
scale items for PAC that we adapted from Jansen et al. (2005) produced better model fit when reflecting RAC, and vice versa. We proceed with the better fitting model as it appears in keeping with Zahra and George (2002).

We conducted an additional CFA to assess the validity of the second-order factor, Learning Orientation, comprised of Learning Commitment, Open-Mindedness, and Shared Vision. This model appears in Appendix E. Model fit was acceptable with cmin/df of 1.773, CFI of .979, PCFI of .727, and RMSEA of .068 with PClose of .102.

**Common Method Variance**

We tested for common method bias using a post hoc procedure suggested by Podsakoff and Organ (1986). Using the principal components factor analysis, evidence of common method bias exists when a single factor emerges from the analysis, or one general factor accounts for the majority of the covariance in the interdependent and dependent variables. Those conditions do not exist in our factor analysis. Also, the inclusion of objective performance data for the model’s dependent variable is beneficial in addressing common method bias.

**Reliability and Validity Analysis**

To assess the measurement model’s reliability, convergent and discriminant validity, we used the composite reliability coefficient (CR), average variance extracted (AVE), maximum shared variance (MSV), and average shared variance (ASV). Composite reliability levels were all above .80 and exceeded AVE levels, indicating good convergent validity. ASV for each factor was comfortably below AVE, indicating good discriminant validity, although the MSV for the PAC and RAC constructs is high since
they are both components of ACAP. Descriptive statistics and correlations of latent factors are provided in Table 3 and item correlations are provided in Appendix F.

### TABLE 3
Descriptive Statistics and Correlations of Latent Factors

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>DE</th>
<th>SV</th>
<th>LC</th>
<th>OM</th>
<th>PAC</th>
<th>RAC</th>
<th>RPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>DE</td>
<td>5.04</td>
<td>1.58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SV</td>
<td>6.18</td>
<td>.88</td>
<td>.894</td>
<td>.922</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC</td>
<td>5.26</td>
<td>1.22</td>
<td>.427</td>
<td>.614</td>
<td>.860</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OM</td>
<td>5.17</td>
<td>1.10</td>
<td>.604</td>
<td>.632</td>
<td>.561</td>
<td>.787</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAC</td>
<td>4.82</td>
<td>1.09</td>
<td>.622</td>
<td>.508</td>
<td>.473</td>
<td>.709</td>
<td>.748</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAC</td>
<td>5.28</td>
<td>1.07</td>
<td>.729</td>
<td>.466</td>
<td>.414</td>
<td>.694</td>
<td>.888</td>
<td>.860</td>
<td></td>
</tr>
<tr>
<td>RPD</td>
<td>3.36</td>
<td>.94</td>
<td>.439</td>
<td>.225</td>
<td>.317</td>
<td>.339</td>
<td>.335</td>
<td>.443</td>
<td>.872</td>
</tr>
</tbody>
</table>

All factors used a 7-pt Likert scale except RPD, which used a 5-pt Likert scale. Diagonal SQRT of AVE.

### Hypotheses Testing and Results

Hypotheses were tested using covariance-based structural equation modeling (SEM) with AMOS. Results are shown in Table 4 and the model in Figure 3.

### TABLE 4
Model Results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Structural Paths</th>
<th>Estimates (Unstandardized)</th>
<th>Critical Ratio</th>
<th>p-value</th>
<th>Hypothesis Support (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>PAC ← DE</td>
<td>.101</td>
<td>2.262</td>
<td>.024</td>
<td>Yes</td>
</tr>
<tr>
<td>H1b/H3a</td>
<td>RAC ← DE</td>
<td>.220</td>
<td>4.523</td>
<td>***</td>
<td>Yes</td>
</tr>
<tr>
<td>H1c/H2c</td>
<td>RAC ← PAC</td>
<td>1.034</td>
<td>5.532</td>
<td>***</td>
<td>Yes</td>
</tr>
<tr>
<td>H2a</td>
<td>PAC ← LO</td>
<td>.380</td>
<td>4.623</td>
<td>***</td>
<td>Yes</td>
</tr>
<tr>
<td>H2b</td>
<td>RAC ← LO</td>
<td>.071</td>
<td>.773</td>
<td>.439</td>
<td>No</td>
</tr>
<tr>
<td>H3b</td>
<td>RPD ← DE</td>
<td>.158</td>
<td>2.541</td>
<td>.011</td>
<td>Yes</td>
</tr>
<tr>
<td>H3c/H4a</td>
<td>RPD ← RAC</td>
<td>.178</td>
<td>2.115</td>
<td>.034</td>
<td>Yes</td>
</tr>
<tr>
<td>H4b</td>
<td>RRAR ← RPD</td>
<td>.267</td>
<td>2.548</td>
<td>.011</td>
<td>Yes</td>
</tr>
</tbody>
</table>
FIGURE 3
Model with Results of Hypothesized Paths

Mediation hypotheses were tested by first examining the direct effect of the antecedent on the outcome without the mediator included, and then by examining the direct effect with the mediator included, followed by the effect of the mediator on the outcome. The results of those tests, including levels of significance, are provided in Table 5.
TABLE 5
Results of Mediation Tests, Standardized Effects

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relationship</th>
<th>Direct Beta w/o Med</th>
<th>Direct Beta w/ Med</th>
<th>Indirect Beta</th>
<th>Mediation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Partial Mediation</td>
<td>DE --&gt; PAC --&gt; RAC</td>
<td>0.444***</td>
<td>0.298**</td>
<td>0.144*</td>
<td>Partial Mediation</td>
</tr>
<tr>
<td>H2: Partial Mediation</td>
<td>LO --&gt; PAC --&gt; RAC</td>
<td>0.436***</td>
<td>0.067 n.s.</td>
<td>0.375**</td>
<td>Full Mediation</td>
</tr>
<tr>
<td>H3: Partial Mediation</td>
<td>DE --&gt; RAC --&gt; RPD</td>
<td>0.30***</td>
<td>0.278*</td>
<td>0.179*</td>
<td>Partial Mediation</td>
</tr>
<tr>
<td>H4: Indirect Effect</td>
<td>RAC --&gt; RPD --&gt; RRAR</td>
<td>0.018 n.s.</td>
<td>-0.075 n.s.</td>
<td>0.048*</td>
<td>Indirect Effect</td>
</tr>
</tbody>
</table>

* p<0.05; **p<0.01; ***p<0.001

As indicated, the test results provide support for mediation in the first three hypotheses. Support for hypothesized partial mediation was found for H1 (that PAC would partially mediate the effect of DE on RAC) and H3 (that RAC would partially mediate the effect of DE on RPD). For H2, however, the mediation was found to be full rather than partial. Thus, PAC was found to be such a powerful mediator that it fully absorbed the effect of LO on RAC. Hypothesis four was supported in that RAC did not have a significant direct on RRAR, regardless of the presence of RPD. Therefore, the effect of RAC on RRAR only occurs indirectly through RPD in the model.

In order to establish further validity for using survey respondents’ perceptions of their endowments’ relative degree of diversification, we conducted our own calculation of each institution’s degree of diversification based on asset allocation data from the 2008 NACUBO Endowment Study. We used a diversification measure based on the sum of the squared portfolio weights (SSPW) (Goetzmann & Kumar, 2008):

$$SSPW = \sum_{i=1}^{N} w_i^2$$

Where $N$ is the number of asset classes held by the investor and $w$ is the weight of each asset class as a percentage of the total portfolio. A lower value of SSPW represents a
higher degree of portfolio diversification. The .324 correlation between endowments’ SSPW measure of diversification relative to their size peers and respondents’ perceptions of diversification relative to size peers is significant at the .01 level, providing support that respondents’ perceptions of relative diversification reflect actual relative diversification. The correlation of the SSPW score to relative risk-adjusted returns also was positive, .258, and significant at the .01 level. This examination increases our confidence in our study’s measure of relative portfolio diversification.

The control variable for the number of full-time professional investment staff had a significant effect on relative risk-adjusted performance. Model fit is acceptable with cmin/df of 1.764, CFI of .934, and RMSEA of .068.

**Discussion and Contributions**

This research extends our understanding of the ACAP construct in a number of ways. First, we demonstrate its usefulness in an entirely different domain, that of policy-making committees, from its previous applications. Policy-making groups must be able to recognize and acquire relevant external information, and then apply or exploit their expanded knowledge. In the field of institutional money management, market conditions are always changing and new investment vehicles and strategies are constantly being developed. Investment fiduciaries must have the ability to obtain relevant information in a dynamic environment and then to capitalize on it. In recent decades, investment fiduciaries generally have expanded their knowledge of an increasing number of asset classes and been able to reap the performance benefits of more widely diversified portfolios. We would expect that the ACAP framework would have applicability in a wide range of policy-making and other decision-making settings.
Second, our findings broaden our understanding of how certain group norms help to increase the group’s ACAP. A learning orientation—consisting of shared vision, learning commitment and open-mindedness—was found to have a significant effect on PAC, the group’s ability to recognize and acquire relevant external information. This result has some relevance to learning antecedents such as “psychological safety” (Edmondson, 1999) and network relationships (Nahapiet & Ghoshal, 1998) in that group members who feel a sense of collective purpose and connectedness may be more motivated to learn. The “open-mindedness” dimension appears to be particularly important in helping groups examine biases and assumptions that may have kept them from understanding both opportunities and risks. By challenging prior assumptions, groups may develop more realistic assessments about risks (Sjoberg 2000); investments that previously were considered too risky may be viewed as beneficial once their characteristics and role in a portfolio are better understood. In addition, open-mindedness may help groups overcome difficulties such as groupthink that are associated with a strong desire for cohesiveness (Janis, 1972). To our surprise, the effect of LO on PAC was so significant as to absorb the direct effect of LO on RAC. In sum, group leaders who foster a learning environment may improve the group’s ability to conduct environmental scanning or search (Cyert & March, 1963). The resulting higher PAC can then be expected to augment RAC.

Third, the study provides support to other research taking a two-dimensional approach to ACAP. While additional dimensions may provide further nuances, we believe the two-dimension approach ably captures the distinction between getting the needed knowledge and “exploiting it for commercial benefit” (Cohen & Levinthal, 1990).
The latter dimension implies an ability to interpret and even transform the acquired knowledge. Our findings help to clarify the roles of PAC and RAC, with PAC expanding the group’s exposure to and acquisition of relevant external information, and RAC enhancing the group’s ability to apply it successfully.

Fourth, we provide a slightly different measure for capturing a group’s “prior related knowledge” that includes both depth and breadth of investment expertise. This measure, although tailored to institutional portfolio management, addresses both the experience and knowledge diversity components outlined by Cohen and Levinthal (1990). The diverse expertise on the committee contributes directly to more diversified portfolios, but also through its effect on both PAC and RAC. The group’s existing expertise likely gives rise to a greater sense of collective efficacy and agency (Bandura, 2000), which is then linked to favorable outcomes.

Finally, this research provides several practical contributions to endowment leaders and particularly with regards to the composition of the committee and the type of group norms that are fostered. Leaders need to select committee members so that the group as a whole possesses investment expertise with experience in multiple asset classes; this may require examination of any policies that limit committee membership to alumni, board of trustees members, or sizable donors. This does not mean that every member needs a professional investment background but rather that the group overall has a strong understanding of investments generally as well as expertise across different types of investments. Leaders can promote a learning orientation by helping to develop a shared vision for the group; that will establish a greater sense of purpose and thus contribute to the group’s motivation and effort levels. In addition, by providing
continuing learning opportunities and promoting open debates, group leaders will provide an environment where members become more capable of acquiring, assessing and applying investment information successfully.

Lastly, endowment leaders may want to pay close attention to the strong effect of this study’s control variable—number of staff with significant investment expertise—on endowments’ performance relative to their peers of similar size. The fact that size of professional investment staff had a significant effect on relative performance suggests that larger staffs can make important contributions in such tasks as screening, monitoring, and recommending investment managers. Undoubtedly, the contributions from staff relate not only to quantity of staff but also to quality. While many endowment fiduciaries may be resistant to the idea of additional staff-related costs, they should consider that the resulting stronger performance may significantly exceed the higher staff costs.

**Limitations and Implications for Future Research**

Several limitations merit discussion. Among those is the short measurement period of five years; longer periods are clearly preferable in studies involving investment performance. Shorter periods are more affected by abnormalities in the financial markets and thus might indicate relationships among factors that would not hold true over much longer periods. For example, during the 2005-2009 measurement period, portfolios with heavy weightings to hedge funds, fixed income and cash produced higher risk-adjusted and absolute returns than those with heavy allocations to equities, although that may not typically be the case over much longer periods.

Another salient limitation is that our study did not account for unique goals and objectives of participants. For example, we examined the effect of ACAP on relative
degree of portfolio diversification, although a portfolio with very broad (or even equal) allocations among asset classes may not be appropriate for the university’s goals. Committees whose endowments have an extremely low annual distribution may want to give greater weights to higher-volatility asset classes which could be expected to provide higher absolute returns over time. Others with larger annual distributions may find it preferable to overweight lower-volatility asset classes with higher income; they may be willing to sacrifice some degree of absolute return in order to have more stability. In sum, this study uses relative risk-adjusted returns as its dependent variable which may not be the preeminent goal of most endowments.

While our risk-adjusted return factor accounts for risk by dividing annualized absolute returns by the standard deviation of returns, it does not capture all of the sources of absolute return. As noted previously, the sources of absolute return from a portfolio consist of the asset allocation, the security selection within the asset classes and the timing of transactions (Ibbotson & Kaplan, 2002). Asset allocation is generally believed to explain the vast majority of return of portfolios over time, followed by security selection and timing. Obviously, portfolios with very significant weightings in the top-performing asset classes would be expected to perform better than those with heavy weightings in the worst performing asset classes. However, when comparing portfolios in the cross-section, the selection of specific investments (i.e., securities) and the timing of investment transactions play a bigger role than they do in explaining performance variance over time. Thus, a limitation of this study is that it does not capture the contributions of active management to performance.
The role of active investment managers (as opposed to indexing) in explaining performance variance is extremely important since the managers select the investments within the asset classes and have considerable control over the timing of transactions. Ibbotson and Kaplan (2002) have demonstrated that the larger the portion of the portfolio that is actively managed, the greater the explanation of absolute performance variance among funds. Of course, using active management for larger portions of the portfolio does not automatically equate to higher returns since half of active managers (or more than half after subtracting fees) can be expected to underperform their index. Thus, the ability of the endowment team (including contributions from the committee, staff and consultants) to select superior active managers can be considered a critical contributor to absolute performance.

It is possible that the committee’s competence, possibly measured by its realized absorptive capacity, would correlate positively to the selection of superior active investment managers. Similarly, perhaps the committee’s realized absorptive capacity contributes to hiring consultants and staff with the ability to help select superior managers. In other endowment-specific research, top performers were found to have greater abilities in selecting venture capital partners (Lerner et al., 2007) and in increasing allocations to the asset classes where they have particular skills (Brown et al., 2007). If those superior hiring and allocation decisions were made by the investment committee, they possibly were outcomes of the committee’s absorptive capacity. In sum, we would expect that committees’ greater absorptive capacity would be manifested in other ways besides greater portfolio diversification, a topic that could have appeal for future research.
A related topic of potential appeal for future research would be an examination of specific processes that lead to the selection of superior managers. This inquiry might include an examination of network ties, managers used by top-performing endowments, careful examination of managers’ performance in various market conditions, longevity of managers, etc. A qualitative study likely would help to inform quantitative analysis.

Lastly, while we believe our findings may have relevance beyond university endowments to other aspects of institutional money management, the domain in which we tested our model is limited. Future research may want to apply our model’s learning orientation factor and absorptive capacity framework in other investment settings as well as in other policy-making domains. Given the need for essentially all organizations to keep learning in order to remain relevant and effective, we would expect that aspects of our model and findings could provide useful fodder in additional settings.
CHAPTER IV: OVERALL REFLECTIONS FROM DISSERTATION PROJECT

All of the research-related courses in the doctorate program played important roles in helping me understand how to design, implement and analyze scholarly research projects. With a background in journalism prior to investment management, I was experienced in interviewing people, but I had never learned how to set up a study so that I could attempt to uncover clear differences between groups of interviewees in a sophisticated way. By specifically targeting interviewees from two groups – top-quartile and bottom-quartile performers within a specified range of endowment size – I was able to ascertain distinguishing factors that proved to be invaluable in the subsequent quantitative studies. Without the clearly differentiated results from the two groups in the qualitative study, I do not believe I would have had the same confidence in selecting constructs to use in the quantitative studies.

In many ways, the quantitative studies simply confirmed several of the findings from the qualitative study: a) that committees with experts in a variety of asset classes would be correlated with more diversified portfolios; b) that committees that put forward more effort in learning about investment strategies and asset classes would have more diversified portfolios; c) that committees that fostered open debates about investment assumption would have more diversified portfolios; d) that committees that carefully considered the principles of Modern Portfolio Theory would have more diversified portfolios; and e) that more diversified portfolios would have superior risk-adjusted performance.

Stated simply, the overall study was mainly concerned with antecedents to portfolio diversification. In other words, what committee-related factors are significantly
related to broader portfolio diversification, and can reasonable arguments be made as to the sequencing of antecedents?

What emerged from my qualitative study was an overall portrayal that endowments with superior 10-year performance records were governed by committees with superior processes and competence. Their competence appeared to be partially derived from their previous experience (before even joining the committee) but it also appeared to be augmented through group learning. Participants gave examples of lengthy educational sessions to learn about asset classes and the strategies and history of various investment managers they considered hiring. They spent considerable time studying the practices and performance of their size peers and of successful endowments of much larger sizes. They encouraged vigorous debates in their committee meetings and noted that important learning occurred during those contested sessions. Yet they also emphasized the essentiality of having a group that was committed to a common purpose, rather than having splintered or self-serving interests. When considering a new asset class to add to the portfolio, they worked hard to understand the expected risks and returns of the particular asset class as well as its expected interaction with the other investments in the portfolio. And they believed emphatically that broadening the portfolio into alternative asset classes contributed significantly to higher risk-adjusted returns.

In conducting literature reviews I remember how excited I was to come across research using a second-order factor called learning orientation because it contained three factors (open-mindedness, learning commitment and shared vision) that interviewees from top-performing endowments had emphasized. Knowing that these scales had been
validated in previous research in a setting where information processing was important
gave me the confidence to include them in my survey. I also wanted to capture the
committee’s consideration of the principles of Modern Portfolio Theory, not only because
the top performers emphasized the attention they gave to these factors but also because
the theory clearly calls for broader portfolio diversification as a way to improve risk-
adjusted returns. Since no latent construct existed, I developed the scale myself, which
was used in my first quantitative study, in Appendix H (the survey items for that
construct are on page 170) and pretested it among a group of investment professionals.
Later, although after the survey already had been conducted, I had the pleasure of
meeting Professor Markowitz and the additional pleasure of his stamp of approval: that
the scale, indeed, captures the essence of Modern Portfolio Theory.

To represent the aspect of building committee competence that was salient in the
qualitative study, I decided that the absorptive capacity framework would be appropriate
because of its ability to assess whether the committee could obtain essential information
about asset classes and act upon it successfully. Investment management, like many
fields, is largely a matter of acquiring relevant knowledge and knowing how to act on it
successfully. This ability to implement successfully, as expressed in the exploitation
dimension of absorptive capacity, would be a fair representation of the collective efficacy
and collective agency characteristics that appeared in the qualitative interviews. Another
advantage of using the absorptive capacity framework was that it clearly states that pre-
existing related knowledge serves as an antecedent. This fit well with the other findings
from interviews regarding the importance of having expertise in various asset classes on
the committee. I had been fascinated by the absorptive capacity construct since I first
began my literature search, and believed this domain of institutional money management would be appropriate for demonstrating its applicability beyond the domains of information systems and innovation where most previous research on the framework had been conducted. Existing scales for measuring absorptive capacity varied considerably in the literature, so I selected items from multiple scales and adapted them for the investment management domain.

My qualitative study, survey and first quantitative paper using Portfolio Theory had been completed before I began an expanded literature review in preparation of the written and oral qualifying exams. I found the months of intensive reading to be among the most enjoyable and satisfying of the program, and I greatly appreciated the additions to my reading list from my committee members. Not only did I gain a greater understanding of certain theories and their application in numerous studies, but I also felt increasingly pleased with the constructs I had included in my survey and the hypotheses I would be making in my final quantitative paper.

In particular, I enjoyed the additional reading in the area of organizational learning since there are many similarities between it and the absorptive capacity (ACAP) framework. As examples, both frameworks refer to the learning process as being path dependent, cumulative, and critical for knowledge creation and innovation (Simon, 1991; Cohen & Levinthal, 1990). Both frameworks have relevance to my research since they both describe a process of organizations (or groups) building their knowledge and overall capacity to perform. I prepared a table, Table 6, to capture the dimensions commonly used in each framework. The dimensions of organizational learning tend to be referred to
as processes whereas those of ACAP have been referred to either as processes or learning capabilities; I have referred to them as capabilities in the table.

**TABLE 6**
Comparison of Dimensions of Organizational Learning and Absorptive Capacity

<table>
<thead>
<tr>
<th>Organizational Learning (Processes)</th>
<th>Absorptive Capacity (Capabilities)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Information Acquisition</td>
<td>1. Recognize (Acquire)</td>
</tr>
<tr>
<td>2. Information Sharing</td>
<td>2. Assimilate</td>
</tr>
<tr>
<td>3. Information Interpretation</td>
<td>2. REALIZED ACAP</td>
</tr>
<tr>
<td>4. Information Storage (Memory)</td>
<td>3. Exploit</td>
</tr>
<tr>
<td>(March, 1991)</td>
<td>(Cohen &amp; Levinthal, 1990)</td>
</tr>
<tr>
<td>(Zahra &amp; George, 2002)</td>
<td></td>
</tr>
</tbody>
</table>

As shown, organizational learning has been depicted as having four processes by certain theorists (Huber, 1991; Tippins & Sohi, 2003) or, more simply, as having two broader processes of “explore” and “exploit” (March, 1991). While the broader “explore” process may capture both the “information acquisition” and “information sharing” concepts fairly well, the mapping of “information interpretation” and “information storage” to “exploit” is not as true. Other learning researchers using two processes have referred to them as organizational search and trial/error (Levitt & March, 1988) or as reflection and action (Edmondson, 2002). The first step typically harkens back to the conceptualization of search by Cyert and March (1963), ably described as follows: “Just as organizations learn what to strive for in their environment, they also
learn to attend to some parts of that environment and not to others. One part of such adaptation is in learning *search* behavior.” This concept of attending to important cues in the environment has strong similarities to Karl Weick’s (1993) sense-making concept. As shown in Table 6, learning theorists differ as to whether taking action (or exploiting) is a requirement of organizational learning. Huber (1991) and Tippins and Sohi (2003) clearly do not have that requirement. In fact, Huber states that organizational learning has occurred if, through its processing of information, the range of its *potential* behaviors has changed. Others such as Edmondson (2002) clearly require that action must be taken in order for learning to have occurred.

In terms of overlap in dimensions between organizational learning and absorptive capacity, strong similarities exist in the acquisition and assimilation stages. Whereas there is some disagreement among organizational learning theorists as to whether “action” is required, ACAP theorists appear unified. In fact, action alone is not sufficient in the ACAP framework—it must be successful action, or, as Cohen & Levinthal (1990) put it, information must be exploited for commercial benefit. At first glance, it might appear that the “exploit” construct used by March (1991) and also by Cohen & Levinthal (1989, 1990) would have similar meaning, but upon closer reading I could see clear differences. March referred to the “exploitation of old certainties” and warned that too much emphasis on it (with reduced emphasis on exploration) would leave a firm incapable of adapting. His description of exploitation implied squeezing the most profits possible from a production process, without any indication that learning would occur in the exploitation mode. Cohen and Levinthal (1990) and subsequent theorists in the ACAP framework were more expansive in their portrayal of exploitation, emphasizing its
role in the learning process. In a reconceptualization of the ACAP framework, Zahra & George (2002) offered two larger components, potential and realized absorptive capacity, each having two sub-dimensions.

It is not surprising that the ACAP framework has considerable overlap with organizational learning since Cohen & Levinthal referred to ACAP as a learning capacity. I found the ACAP framework more applicable than organizational learning to my study due to its stronger emphasis on both the value of “external” information and the importance of “prior related knowledge” as a pre-condition for building ACAP. In investment management, the markets are constantly changing and this external knowledge must be constantly procured and analyzed. This also applies to constantly evolving investment products and strategies. Cohen & Levinthal (1990) also stressed the importance of diversity of perspectives, which fit well with interviewees’ statements about the benefits derived from committee members’ experience with a variety of asset classes. Lastly, Cohen & Levinthal emphasized the necessity of intense effort in building absorptive capacity; this was in accordance with the concept of learning commitment that had been expressed by officers at top-performing endowments. As for operationalizing the ACAP framework, while I appreciate the fuller portrayal in Cohen & Levinthal’s three-step ACAP process of information acquisition (or recognition), assimilation and exploitation, I decided to use Zahra and George’s two-dimensional conception of potential and realized ACAP as it was more amenable to empirical testing.

Other readings that I particularly enjoyed pertained to group dynamics and norms that provide a contextual climate for learning and effective decision-making. One with particular relevance to my research was Peter Senge’s *The Fifth Discipline.* Although I
read Senge’s book a full year after developing my survey instrument, I was struck by the similarities between the constructs in my survey and the learning disciplines he outlined. The shared vision construct mapped precisely, conveying a shared sense of purpose and operating values that help to motivate people. Senge’s team learning, personal mastery and mental models disciplines encompassed aspects of the open-mindedness and learning commitment constructs in my model. Senge stressed the importance of dialogue in which disagreement and even conflict can lead to new courses of action.

Other readings about cognitive conflict and its role in improving the quality of decisions led to further appreciation of the open-mindedness construct in my study. Research by Jehn (1995) revealed how disagreements within groups can be detrimental if they are related to routine tasks but how they can be beneficial when related to non-routine tasks. Disagreement in non-routine tasks, also called task conflict, promote critical evaluation of problems and decision options, thus improving performance. This jibed with information I received from financial officers at top-performing endowments as they wrestled with decisions about changes in investment policy to include additional asset classes (decisions which, in my opinion, clearly qualify as non-routine). Jehn stressed the importance of getting the right balance between too little and too much task conflict: with too little, the group becomes complacent; yet with too much, people become overwhelmed with the amount of conflicting information and may lose sight of the purpose of the discussion.

Amason (1996) provided further insights regarding the benefits of rigorous debates of different or opposing viewpoints. He distinguished between cognitive conflict, which is task oriented and involves judgmental differences about the best way to
achieve objectives, and affective conflict, which tends to be emotional and focused on personal friction. Cognitive conflict was found to lead to greater understanding of the issues, higher quality decisions, and commitment to the decisions, while affective conflict undermined consensus and had a detrimental effect on decision quality. In my model, the open-mindedness construct captured aspects of cognitive conflict related to questioning each others’ biases and assumptions. And it provided clear benefits of increasing the acquisition and assessment of relevant, external information.

The open-mindedness construct appears to be beneficial also in preventing the occurrence of extreme cohesiveness associated with groupthink in which groups, in their desire to be united and to avoid upsetting the group, ignore information that is critical to good decision making. Irving Janis’ 1972 book, *Victims of Groupthink*, provided vivid examples of closely knit presidential advisers who ignored strong evidence of impending disasters such as the Bay of Pigs invasion, the bombing of Pearl Harbor and the humiliating incursion into North Korea. If an environment of open-mindedness is promoted, it would likely combat tendencies toward groupthink.

With regards to asset allocation decisions, I believe that the critical assessment aspect of the open-mindedness construct helps investment committees overcome familiarity biases and irrational risk perceptions that were described in chapter two. In a group environment where open debates and critical assessments are promoted, committee members would more likely start to understand and appreciate the characteristics of asset classes not previously held in the portfolio. A group’s commitment to learning, of course, also would be expected to contribute to greater understanding as it relates to the degree of continual effort put forth.
Readings about the benefits of having diverse perspectives in a group or organization buffeted my belief in the need for careful selection of investment committee members. It seemed like such a no-brainer to me to hypothesize that committees with expertise in a wider range of investments (asset classes) would adopt policies with broader portfolio diversification than those without such a variety of knowledge. However, since no study had previously tested that hypothesis in the investment domain, it seemed well worth including. And since Cohen and Levinthal (1989, 1990) had emphasized the importance of prior related knowledge as a precursor to absorptive capacity, I wanted to measure the effect of diverse expertise on both dimensions of ACAP.

The literature regarding benefits of diverse cognitive perspectives, or functional diversity, is rich indeed, showing its positive links to innovation, communication both within teams and with external contacts, effective debates, decision quality, and performance (Forbes & Milliken, 1999; Horwitz & Horwitz, 2007). Given the literature linking functional diversity and effective debates, I was gratified to see in my own data the very significant, positive correlation between diverse expertise and open-mindedness, which was stronger than the relationship between diverse expertise and the other independent variables.

After completing the qualifying exams, it was time to turn full attention back to my survey data. While we had learned in our quantitative research courses how to conduct factor analysis and structural equation modeling, it was truly thrilling to settle down with my own data and start assessing whether factors would be reliable and whether the model would hold up. I was surprised that I had to throw out certain items
from my survey and I learned the importance of precise wording of items in measurement scales. I also learned that tests of mediation can be surprising in novel models. A test of partial mediation may indicate full mediation instead, or vice versa. With a rich data set, I also learned that there are numerous statistical analyses that can be conducted, and I am hopeful of producing at least one additional study from this data.

After analyzing the results of the structural equation models, and enjoying a degree of satisfaction that my hypotheses were generally supported, I still had a nagging question. If I divided my sample into two groups—one with the most diversified portfolios from each size category and one with the least diversified portfolios from each size category—would the two groups differ significantly on all of the antecedents I had used in my two quant models? I suspected that would be the case, but I wouldn’t know for sure until I conducted independent-samples t-tests. Below is a graph (Figure 4) showing the mean scores for each factor by group. The differences in the mean scores are clearly visible in the graph, and Table 7 shows the level of significance in the differences between the two groups. As shown, endowments with more diversified portfolios scored significantly higher on diverse expertise (DE), shared vision (SV), learning commitment (LC), open-mindedness (OM), portfolio theory (PT), potential absorptive capacity (PAC) and realized absorptive capacity (RAC). The level of significance in the differences in means between groups was at the p<.001 level for all factors except shared vision, where it was significant at the p<.01 level. This was a gratifying result.
FIGURE 4
Comparison of Means of Composite Factor Scores
(Two Groups: Less Diversified vs. More Diversified Portfolios in Each Size Cat)

![Bar chart showing comparison of composite factor scores]

TABLE 7
Means, Std. Dev. and Significance Levels of Indpt – Samples T-Test
(Grouped by Degree of Portfolio Diversification in Each Size Category)

<table>
<thead>
<tr>
<th>Factor</th>
<th>LessDivPort (within each size cat) n=83</th>
<th>MoreDivPort (within each size cat) n=85</th>
<th>Indpt Samples T-Test Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diverse Expertise (DE)</td>
<td>Mean 4.41</td>
<td>5.65</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Std. Dev. 1.71</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>Learning Commitment (LC)</td>
<td>Mean 4.91</td>
<td>5.60</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Std. Dev. 1.32</td>
<td>1.02</td>
<td></td>
</tr>
<tr>
<td>Shared Vision (SV)</td>
<td>Mean 5.97</td>
<td>6.38</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Std. Dev. 1.02</td>
<td>0.68</td>
<td></td>
</tr>
<tr>
<td>Open-Mindedness (OM)</td>
<td>Mean 4.82</td>
<td>5.52</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Std. Dev. 1.20</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Potential ACAP (PAC)</td>
<td>Mean 4.51</td>
<td>5.12</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Std. Dev. 1.12</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>Realized ACAP (RAC)</td>
<td>Mean 4.85</td>
<td>5.70</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Std. Dev. 1.09</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>Use of Portfolio Theory (PT)</td>
<td>Mean 5.39</td>
<td>5.97</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Std. Dev. 1.01</td>
<td>0.84</td>
<td></td>
</tr>
</tbody>
</table>

***p<.001  **p<.01
Although I am generally satisfied with my findings, I fully realize that I did not capture many other factors that may contribute to endowment performance. As discussed previously, my study did not measure the contributions of individual security selection and the timing of transactions. Those functions are typically performed by external investment managers, and, to a much smaller extent, by internal managers. However, in retrospect, I would have liked to have attempted to capture committees’ ability to select superior managers. Perhaps that could have been accomplished by asking if their endowment’s investment managers outperformed their benchmarks over the measured timeframe and then by including that construct as a mediator of the effect of realized absorptive capacity on risk-adjusted returns. I suspect it would have boosted my model’s $R^2$ of .09 for risk-adjusted returns considerably. I suppose it is the lot of researchers to look back and see how their research design might have been improved!!

The significance of the staff’s influence on performance cannot be overlooked in my study. As shown in the Figure 5 below, the size of the investment staff had even a greater influence on relative risk-adjusted returns (standardized estimate of .23, p<.01) than the degree of relative portfolio diversification (standardized estimate of .19, p<.05). I did not include a hypothesis about the effect of staff size on performance since staff size has been shown to be correlated with performance in NACUBO studies; therefore, I included it as a control variable. However, this is the first study that I’m aware of that demonstrates its significance on performance among endowments of similar size.
This result led me to look further in my data for clues about the role and impact of the staff. The two questions below from my survey, with responses from top-performing endowments compared to those of bottom-performing endowments, provide some insights.
Question 1: Which body made final decisions about hiring/firing managers?

**TABLE 8**
Responsible for Hiring/Firing Managers

<table>
<thead>
<tr>
<th></th>
<th>Top-Half Performers (in each size category, by risk-adjusted returns)</th>
<th>Bottom-Half Performers (in each size category, by risk-adjusted returns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Trustees/ Foundation</td>
<td>11.9%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Committee</td>
<td>59.5%</td>
<td>77.4%</td>
</tr>
<tr>
<td>Outsourced CIO (Invest.Mgt. Firm)</td>
<td>8.3%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Consultant</td>
<td>0.0%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Staff</td>
<td>20.2%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Question 2: Which body had the most influence about hiring/firing consultants?

**TABLE 9**
Influence on Hiring/Firing Consultants

<table>
<thead>
<tr>
<th></th>
<th>Top-Half Performers (in each size category, by risk-adjusted returns)</th>
<th>Bottom-Half Performers (in each size category, by risk-adjusted returns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Trustees/ Foundation</td>
<td>1.20%</td>
<td>7.20%</td>
</tr>
<tr>
<td>Committee</td>
<td>68.30%</td>
<td>72.30%</td>
</tr>
<tr>
<td>Outsourced CIO (Invest.Mgt. Firm)</td>
<td>2.40%</td>
<td>1.20%</td>
</tr>
<tr>
<td>Staff</td>
<td>26.80%</td>
<td>18.10%</td>
</tr>
</tbody>
</table>

The answers to the questions above indicate the greater role that staff play at top-performing endowments in making final decisions for hiring/firing managers and in influencing the hiring/firing of consultants. I compared the average staff size from all the top-half performers in each size category to the average staff size from all the bottom-half performers in each size category: 2.7 to 1.9, a difference that is statistically significant. Given that the top-performing endowments generally have bigger staffs, it is not...
surprising to see their greater involvement in hiring/firing managers and consultants. Undoubtedly, where they have the authority, the committee’s ability to hire sufficient and quality staff is an important factor, just as its ability to hire quality managers and consultants.

Jay Yoder, a professional investment manager who has served as director of investments for Vassar and Smith Colleges and who has authored two books (Yoder, 2004, 2011) on endowment management, states that the investment staff can provide the following benefits:

- Drafting a more sophisticated investment policy statement (which goes to the committee for review and approval);
- Greater due diligence and monitoring of managers;
- More timely decision-making

According to Yoder, committees typically are not as effective as staff for certain functions because they meet only once a quarter and thus may not be able to make timely decisions. In addition, he states that it is more difficult for consensus-seeking groups to take contrarian positions, which are likely to be the most profitable. And, very importantly, having an investment professional on the staff brings more accountability to the investment process. Yoder states that a competent investment office (consisting of at least one full-time investment professional) can be expected to easily add 1%-2% of incremental return to annual performance. On a $200 million endowment, that incremental return equates to between $2 million and $4 million per year, far more than the staff-related costs.
David Swensen (2009), the highly successful Chief Investment Officer at Yale University, also stresses the value that a competent staff provides in being able to make timely decisions. As an example, he referred to the staff’s purchase of tens of millions of dollars of equities soon after the October 1987 stock market crash, which resulted in significant gains over a short period. The crash had caused the asset allocation of equities to fall below the specified range in the investment policy statement, and thus the staff did not violate the policy but rather took advantage of the drop in equity prices to bring the allocation back up to the policy range. This ability of the staff to “rebalance” the allocations within the stated policy ranges can add significantly to portfolio returns. Certain market opportunities must be seized quickly, which is far more difficult for a committee than for a single chief investment officer.

To gain further insights about the importance of staff to performance (risk-adjusted returns are used in my study), I divided the sample into two groups: one with the top-half performers and one with the bottom half performers from each size category. Since the resulting sample size of 84 in each group was arguably too small to run the full structural equation model in AMOS, I conducted correlation analysis between staff size and performance of the top-performing group and between staff size and performance of the bottom-performing group. I found the results most interesting: while the correlation of staff size to performance is significant for the top-performing group, it is not significant for the bottom-performing group. This may suggest that the top performers not only have a larger staff size but also a more talented staff; thus, I would expect staff quality (although not explicitly measured in this study) to provide significant explanation of performance variance. Among the bottom performers, simply having more staff did
not affect relative performance, but having more staff among top performers augmented relative performance significantly. This perhaps reflects the ability of committees (and any other decision-makers) at top-performing endowments to select exceptional investment talent.

Lastly, an important consideration that I did not address directly in the quantitative studies was the aspect of leadership. In my qualitative study, most financial officers from top-performing endowments referred to leaders or change champions who were instrumental in guiding the committee to adopt broader portfolio diversification. These leaders were described as being able to clearly articulate the benefits of adding new asset classes to the portfolio. Like transformational leaders, they were able to present a vision of the future and to motivate committee members around that vision. It is important to note that these leaders did not want their beliefs or views forced upon committee members. To the contrary, they wanted committee members to have sufficient information and understanding in order to make their own well-reasoned decisions. To that end, they organized educational sessions and encouraged information sharing and open debates. In other words, these leaders demonstrated empowering leadership with the goal of increasing the empowerment of the committees. It was interesting to learn that the leadership role was exercised by people in different positions at the various universities. In some instances, the leader clearly was the chair of the investment committee. In other instances, leadership came from the top financial/investment officer or an investment consultant. And in some instances the leadership role was shared.

While I did not have explicit measures about leadership in my quantitative studies, I believe that the group norms of shared vision, commitment to learning and
open-mindedness reveal the presence of good leadership, including aspects of transformational, directive, inclusive, and empowering leadership characteristics. In addition, the development of a committee whose members have the requisite capabilities is another manifestation of effective leadership. The hiring of a larger investment staff (and especially a very competent one) may also reflect leadership that could provide evidence to the board that additional staff would be worth the cost. In other words, I believe that good leadership served as a “hidden” antecedent to the other factors in my study. Effective leaders were able to get the right people at the table and to establish a group climate that is conducive to effective learning, decision-making and implementation. The following quote by Richard Hackman (2002) eloquently describes the leadership role in teams:

The leader’s main task, therefore, is to get a team established on a good trajectory and then to make small adjustments along the way to help members succeed, not to try to continuously manage team behavior in real time. No leader can make a team perform well. But all leaders can create conditions that increase the likelihood that it will (Hackman, 2002: ix).

In many ways, this research project has been an examination of organizations undergoing change. As noted earlier, university endowments over the past two decades have undergone significant changes as they have diversified into many additional asset classes. Although my quantitative study covered only five years, it would be interesting to know if the model using the group norms of learning orientation and absorptive capacity could help to explain the degree of change in portfolio diversification over a longer period. Over the past couple of decades that have witnessed tremendous broadening of the diversification in endowment portfolios, the issue of “first mover” advantage appears to have played a key role in differentiating top performers from
bottom performers. For example, certain endowments, most notably large ones from prestigious universities, were first movers in alternative asset classes when they were providing exceptional returns. During the technology boom of the late 1990s and 2000, certain large endowments invested in a number of private technology firms and reaped tremendous profits when they went public. Is it possible that committees from those endowments had greater absorptive capacity that led them to make those successful investments?

It would also be interesting to test this model with organizations undergoing quite different types of transformation. Certainly, it seems plausible that a learning-oriented climate could be expected to increase the competence (or absorptive capacity) of a group or organization, which, in turn, could be expected to help bring about positive changes.

As a result of this research, I have a greater appreciation of group dynamics, and especially the group norms and other contextual factors that foster productive interactions, learning and quality decisions. Coupled with the vastly improved research skills I have developed, I intend to continue my research endeavors in group learning, competence building and effective decision-making.
### APPENDIX A
Demographic Profiles of Respondents & Their Organizations

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number of Respondents</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respondent’s Role with College/University</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial officer involved with the endowment</td>
<td>164</td>
<td>98%</td>
</tr>
<tr>
<td>Outsourced Chief Investment Officer</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Investment Committee Member</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Respondent # of Yrs in Endowment Role with the College/Univ</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than or equal to 2.5 years</td>
<td>22</td>
<td>13%</td>
</tr>
<tr>
<td>3 to 5 years</td>
<td>31</td>
<td>19%</td>
</tr>
<tr>
<td>6 to 9 years</td>
<td>28</td>
<td>19%</td>
</tr>
<tr>
<td>10 to 14 years</td>
<td>32</td>
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</tr>
<tr>
<td>15 to 19 years</td>
<td>34</td>
<td>20%</td>
</tr>
<tr>
<td>Greater than 20 years</td>
<td>21</td>
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<tr>
<td><strong>Endowment Size</strong></td>
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<tr>
<td>Category 6: Greater than $1 billion</td>
<td>15</td>
<td>9%</td>
</tr>
<tr>
<td>Category 5: $500 million to $1 billion</td>
<td>18</td>
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</tr>
<tr>
<td>Category 4: $100 million to $500 million</td>
<td>54</td>
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</tr>
<tr>
<td>Category 3: $50 million to $100 million</td>
<td>30</td>
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</tr>
<tr>
<td>Category 2: $25 million to $50 million</td>
<td>25</td>
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</tr>
<tr>
<td>Category 1: Less than $25 million</td>
<td>26</td>
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</tr>
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<td><strong>Institutional Funding</strong></td>
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<td></td>
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<tr>
<td>Public (State Funded)</td>
<td>65</td>
<td>39%</td>
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<tr>
<td>Private</td>
<td>103</td>
<td>61%</td>
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<tr>
<td><strong>Number of Voting Members on Investment Committee</strong></td>
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</tr>
<tr>
<td>Less than or equal to 3</td>
<td>4</td>
<td>2%</td>
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<tr>
<td>4-6</td>
<td>64</td>
<td>36%</td>
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<tr>
<td>7-9</td>
<td>84</td>
<td>47%</td>
</tr>
<tr>
<td>10-13</td>
<td>22</td>
<td>12%</td>
</tr>
<tr>
<td>14-18</td>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td>Greater than or equal to 19</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Number of Meetings/Year of Investment Committee over 5-yr period</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than or equal to 3</td>
<td>6</td>
<td>3.5%</td>
</tr>
<tr>
<td>3-4</td>
<td>99</td>
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<td>5-8</td>
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<td>9-12</td>
<td>14</td>
<td>7.6%</td>
</tr>
<tr>
<td>Greater than or equal to 13</td>
<td>6</td>
<td>3.5%</td>
</tr>
<tr>
<td><strong># of Finance/Investment Staff with Significant Investment Experience</strong></td>
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</tr>
<tr>
<td>0</td>
<td>25</td>
<td>15%</td>
</tr>
<tr>
<td>1</td>
<td>54</td>
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</tr>
<tr>
<td>2</td>
<td>40</td>
<td>24%</td>
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<tr>
<td>3</td>
<td>20</td>
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<tr>
<td>4-7</td>
<td>20</td>
<td>12%</td>
</tr>
<tr>
<td>8-12</td>
<td>7</td>
<td>4%</td>
</tr>
<tr>
<td>13-20</td>
<td>1</td>
<td>.5%</td>
</tr>
</tbody>
</table>
APPENDIX B
Constructs, Definitions and Items

Diverse Investment Expertise (DE): Committee members’ expertise across a broad variety of asset classes
- Our committee over the 5-year period always included expertise across a broad variety of asset classes. (DE1)
- Our committee always included expert knowledge in both traditional and alternative asset classes. (DE2)
- Our committee always included experts in both public and private investments. (DE3)

Learning Commitment (LC): The shared belief that learning is essential for success
- The basic values of the committee included learning as key to improvement. (LC1)
- The committee viewed learning as an investment, not an expense. (LC2)
- The committee was committed to learning about successful endowment practices. (LC3)
- The committee believed learning is a key commodity for long-term success. (LC4)

Open-Mindedness (OM): The committee’s critical assessment of its assumptions, biases and decisions
- Committee members frequently questioned their biases about investing. (OM 1)
- Committee members routinely judged the quality of the decisions they made. (OM2)
- The committee was not afraid to reflect critically on investment-related assumptions it made. (OM3)
- Committee members realized that the way we perceive the markets must be continually questioned. (OM4)

Shared Vision (SV): A common mental model for the direction of the organization
- Our committee was in agreement about the endowment’s purpose. (SV1)
- Committee members were committed to the goals for the endowment. (SV2)
- There was agreement among committee members about the vision for the endowment. (SV3)
- Committee members viewed themselves as partners in our efforts for the endowment. (SV4)

Potential Absorptive Capacity (PAC): The committee’s recognition and acquisition of relevant investment-related knowledge
- The committee stayed informed of endowment management trends and developments at other colleges and universities. (ACAP1)
- The committee collected in-depth information that was relevant to our investment decisions. (ACAP2)
- The committee documented newly acquired knowledge for future reference. (ACAP3)
- The committee quickly determined the usefulness of new investment-related knowledge to existing knowledge. (ACAP4)
Realized Absorptive Capacity (RAC): The committee’s interpretation and exploitation of relevant investment-related knowledge
- The committee quickly analyzed and interpreted changing market conditions. (ACAP5)
- The committee was capable of assessing potential investment opportunities based on its existing knowledge. (ACAP6)
- The committee knew how to implement new investment knowledge. (ACAP7)
- The committee knew how to capitalize on its investment knowledge. (ACAP8)

Relative Portfolio Diversification (RPD): The degree of endowments’ portfolio diversification relative to their size category in annual industry surveys
- Our endowment performance over the SINGLE FISCAL YEAR 2009 relative to our size category was... (RPD1)
- Our endowment’s diversification over the FIVE YEARS ended 2009 compared to our size category was. (RPD2)
- Our endowment’s diversification over the DECADE ended fiscal 2009 compared to our size category was... (RPD3)

Relative Risk-Adjusted Returns (RRAR): Five-year annualized return (through fiscal 2009) divided by the standard deviation of returns over the five years, relative to the average risk-adjusted return for the category of peers of similar size. (Data from NACUBO and NACUBO-Commonfund Annual Surveys)

NOTE: Items in DE, LC, OM, SV, PAC and RAC referred to the 2004-2009 period and were measured using a 7-point scale (1=very strongly disagree, 7= very strongly agree). Items for RPD were measured using a 5-point scale (1=significantly less diversified, 5=significantly more diversified).
APPENDIX C
Pattern Matrix of Extracted Factors

<table>
<thead>
<tr>
<th>PATTERN MATRIX</th>
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<tbody>
<tr>
<td>Factor</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>LC_1</td>
</tr>
<tr>
<td>LC_2</td>
</tr>
<tr>
<td>LC_3</td>
</tr>
<tr>
<td>LC_4</td>
</tr>
<tr>
<td>DE_1</td>
</tr>
<tr>
<td>DE_2</td>
</tr>
<tr>
<td>DE_3</td>
</tr>
<tr>
<td>SV_1</td>
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<tr>
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<td>SV_3</td>
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<td>SV_4</td>
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<tr>
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<td>OM_2</td>
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<tr>
<td>OM_4</td>
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<td>RPD_3</td>
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<tr>
<td>ACAP_1</td>
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<td>ACAP_6</td>
</tr>
<tr>
<td>ACAP_7</td>
</tr>
<tr>
<td>ACAP_8</td>
</tr>
</tbody>
</table>
APPENDIX D
Confirmatory Factor Analysis Model
APPENDIX E
CFA of 2nd-Order Factor, Learning Orientation
### Correlation of Measures for Constructs

| Code | DE_1 | DE_2 | DE_3 | LC_1 | LC_2 | LC_3 | LC_4 | SV_1 | SV_2 | SV_3 | SV_4 | OM_1 | OM_2 | OM_3 | OM_4 | PAC_1 | PAC_2 | PAC_3 | PAC_4 | RAC_1 | RAC_2 | RAC_3 | RAC_4 | RPD_1 | RPD_2 | RPD_3 | RRAR |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| DIE_1 |      |      | **865** |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| DIE_2 | **865** |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| DIE_3 |      | **865** |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LC_1 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LC_2 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LC_3 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LC_4 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| SV_1 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| SV_2 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| SV_3 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| SV_4 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| OM_1 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| OM_2 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| OM_3 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| OM_4 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| PAC_1 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| PAC_2 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| PAC_3 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| PAC_4 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RAC_1 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RAC_2 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RAC_3 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RAC_4 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RPD_1 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RPD_2 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RPD_3 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| RRAR  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

*Correlation is significant at the 0.01 level (2-tailed)*

*Correlation is significant at the 0.05 level (2-tailed)*
REFERENCES


APPENDIX G
Qualitative Research Report

SMALLER COLLEGE ENDOWMENTS:
EXPLORING THE LINKS BETWEEN PERSONALITY CHARACTERISTICS, RISK PERCEPTIONS, AND INVESTMENT PERFORMANCE

By

Mimi Lord
EDM/Mandel Center Fellow

Submitted in Partial Fulfillment of the Requirements for the Qualitative Research Report in the Doctor of Management Program at the Weatherhead School of Management

Advisors:
Tim Fogarty, Ph.D.
Sheri J. Perelli, D.M.
Drew Sellers, D.M.

CASE WESTERN RESERVE UNIVERSITY

December 2009
SMALLER COLLEGE ENDOWMENTS:
EXPLORING THE LINKS BETWEEN PERSONALITY CHARACTERISTICS,
RISK PERCEPTIONS, AND INVESTMENT PERFORMANCE

ABSTRACT

Research on college and university endowments frequently refers to the inability of smaller endowments to achieve the strong investment results of much larger endowments. Reasons cited are their lack of a professional investment staff and their lack of access to superior money managers. Yet there are many smaller endowments with long-term performance records that rival those of much larger endowments. This qualitative study explores factors that differentiate top-quartile and bottom-quartile endowments in the $100 million to $200 million size over a 10-year period. Findings reveal a number of personality and risk-related factors that distinguish top and bottom performers. They suggest that campus fiduciaries are well-advised to select Investment Committee members and consultants with expertise in multiple asset classes who have a strong sense of control and responsibility over decisions. Endowment teams with greater investment knowledge perceive relatively less risk in alternative investments and are more satisfied with performance outcome.

Key words: Risk perception; group efficacy; collective agency; team locus of control; knowledge; absorptive capacity; college endowment; performance
INTRODUCTION

Annual studies of college and university endowment performance demonstrate a positive correlation between size and performance (National Association of College and University Business Officers, or NACUBO,\(^1\) 1990-2008). Large endowments, it is argued, have greater resources to hire talented investment professionals and greater access to top managers, particularly in alternative asset classes\(^2\) (Lerner, Schoar & Wang, 2008). But size alone does not fully explain performance since endowments of similar size may have vastly different results. We sought to understand how certain endowment teams\(^3\) affiliated with relatively small portfolios are able to achieve investment results more typical of considerably larger endowments, and over extended periods.

Over the past couple of decades, endowment teams have generally reduced portfolio allocations to traditional equities and fixed income and increased them to alternative assets. The trend has been led by very large endowments and is positively correlated to size (NACUBO, 2002-2008). Counting all NACUBO Endowment Study participants equally, the average college’s allocation to traditional equities and fixed income combined has dropped from 87.9% in 1999 to 71.1% in 2008. By the end of fiscal 2008, endowments with greater than $1 billion in assets had allocated 48% of their portfolios to alternative asset classes compared to only 7% among those with less than

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\(^1\) Beginning with fiscal 2009, NACUBO has joined with Commonfund Institute to conduct the annual study, renamed the NACUBO-Commonfund Study of Endowments.

\(^2\) Alternative asset classes include private equity, hedge funds, private real estate, venture capital and natural resources, as used in NACUBO Endowment Study. By contrast, U.S. and international equities and fixed income are referred to as traditional asset classes.

\(^3\) Endowment decision makers, typically the Investment Committee with input from top financial officer and governing board.
$25 million (NACUBO, 2008). (Asset allocations and performance of all endowment
categories are in Appendices A and B.)

Researchers suggest caution, however, to investors seeking strong performance
by simply copying the asset allocations of very large endowments, emphasizing the
challenges in selecting top managers, the fact that asset allocations that succeeded in the
past may not prevail going forward; and the inability to know what changes in allocations
or strategies the top performers are making until well after the fact (Lerner, Schoar, &
Wang, 2008).

Unsurprisingly, data from NACUBO document the positive correlation between
size of endowment and investment staff. For example, endowments larger than $1
billion have an average of seven investment professionals on staff whereas those with
$50 million to $100 million have an average of .1 person (or 10% of one person’s time)
devoted to investments (NACUBO, 2008). Typically the chief financial officer not only
oversees the endowment but is responsible for the college’s overall budget, facilities
management, services such as dorms and cafeterias, cash and debt management, etc.
While the top financial officer at colleges with smaller endowments usually attends
investment meetings and has ongoing communication with investment committee
members and consultants, he/she generally does not vote on investment-related decisions.
Those ongoing decisions are normally made by the investment committee, substantially
comprised of volunteer alumni who may be a subset of the governing board, with policy
approval and ultimate responsibility resting with the governing board of trustees or
foundation. In this inquiry endowment teams are defined as the decision-makers, most
often the investment committee but with input and oversight by the financial officer and governing board.

College endowments in general are intriguing to researchers because of their superior performance, on average, compared with other investment pools and indices. During the 10-year period ended June 30, 2008, the average (equal-weighted) college annualized performance among approximately 500 participants in the NACUBO Endowment Study was 6.5%, compared to the Standard & Poor’s equity index annualized return of 2.9%, and a blended portfolio (70% S&P 500; 30% BarCap Fixed Income Aggregate) annualized return of 3.7% (NACUBO Study, 2008). Research comparing college endowment returns with those of pension funds over prolonged periods also provides evidence of colleges’ superior returns (Brown, Garlappi, & Tiu, 2009). With minimal staff resources devoted to the endowment portfolio and limited assets to offer top investment managers, small endowments with stellar performance offer researchers a particularly compelling inquiry.

The media tend to focus their attention on the multi-billion-dollar endowments and provide little insight about the nature of investment management among considerably smaller endowments. To help fill that gap, we conducted a qualitative inquiry based on semi-structured interviews with 20 financial officers of U.S. colleges and universities with smaller endowments to generate a grounded theory about factors that separate top and bottom performers. We readily acknowledge explanatory effects of asset allocation and manager selection upon performance, and look for explanations of “how” and “why”
certain small-endowment teams with minimal staff are able to make such successful decisions.

Understanding determinants of portfolio performance is important for all investors. For college and university endowments, the portfolio’s performance affects the number and size of student scholarships, endowed faculty chairs, certain academic programs, etc. And particularly for private schools that do not receive state support, earnings from the endowment contribute importantly to the institution’s overall operating budget. Given the equity market’s decline, economic weakness, reduced state allocations to higher education and reductions in donor giving in recent years, investment performance of college/university endowments has taken on added significance.

RESEARCH QUESTION

Among colleges and universities with smaller endowments, what factors differentiate top and bottom performers such that top performers achieve investment performance closer to much larger endowments?

LITERATURE REVIEW

In this section we review theories that help to explain the trend toward broader portfolio diversification in college endowments and factors that enable certain colleges to take greater advantage of external knowledge and resources than others. These include theories relating to the diffusion of institutional practices, portfolio optimization, and organizational (or team) abilities that relate to knowledge utilization. Other studies linking specific college factors to endowment performance also are reviewed.
Institutional theory holds that larger organizations typically lead the way in a field or industry with new practices or innovations and are emulated over time by smaller organizations seeking legitimacy and higher status (Meyer & Rowan, 1977; Parsons, 1951; DiMaggio & Powell, 1983). According to the rigid aspects of the theory, small organizations may turn to blind adoption of larger organizations’ practices, and sometimes to their detriment (Meyer & Rowan, 1977).

Institutional theory can be useful in describing aspects of the diffusion of broader diversification within the endowment field, in that endowment teams in general are aware of approaches taken by the Ivy League schools with very large endowments. Early versions of institutional theory were augmented by incorporating rational choice (Abell, 1995), resource-based approach (Oliver, 1977), and strategic management (Bresser & Millonig, 2003). These integrated frameworks permit a more relaxed interpretation of institutional theory, as opposed to the “blind adoption” approach, and are more representative of the operational approaches of college endowment teams.

The two-decade trend in college endowments toward broader diversification adheres to the principles of Modern Portfolio Theory (Markowitz, 1952), which demonstrate that risk-adjusted performance depends significantly upon co-variances, or interactions, of securities within the portfolio (Rubinstein, 2006). Prior to development of Modern Portfolio Theory, investment theory focused more heavily on the merits of individual securities on a stand-alone basis rather than the risk/reward attributes of the overall portfolio. Gibson (2000) demonstrated that portfolios with multiple asset classes, and particularly those with low (or negative) correlations of returns, achieve greater
performance over lengthy periods due in part to the reduction of risks associated with overconcentration in a particular asset class.

The literature substantiates that asset allocation is the single biggest contributor to absolute portfolio performance over time (Brinson, Hood, & Beebower, 1986) but has also demonstrated the influence of security and manager selection within asset classes (Ibbotson & Kaplan, 2000; Brown, Garlappi & Tiu, 2007). A recent study by Lerner, Schoar and Wang (2008) suggests three reasons why top-performing endowment teams over the 1994-2005 timeframe made superior choices of managers and investments within asset classes than did average performers: access to top money managers, or “a seat at the table,” particularly with regard to alternative asset class managers; greater experience of investment staff at top performers; and good timing, referring to the favorable matchup of alternative investments and market conditions over the study period. In a related study, Lerner, Schoar and Wongsunwai (2007) found that top-performing endowments had exceptional abilities in selecting successful venture capital partners. Brown, Garlappi and Tiu (2007) argued that top-performing endowment teams not only pick top managers but also overweight their allocations to asset classes where they have particularly strong selection skills.

Absorptive capacity theory is helpful in explaining how successful endowment teams are able to recognize the value of new, external information, assimilate it and apply it beneficially (Cohen & Levinthal, 1990). An organization’s prior level of related knowledge is important in that it helps to facilitate the learning of new knowledge, and

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4 Asset allocation refers to the percentages of the portfolio invested in different categories (or asset classes) of investments, such as U.S. equities, international equities, fixed-income, alternative asset classes, cash.
application of new knowledge helps to build the base that facilitates further knowledge-building; thus, learning is cumulative (Cohen & Levinthal, 1990). Zahra and George (2002) re-conceptualize absorptive capacity as a dynamic capability that helps firms (or organizations) gain and sustain a competitive advantage. They argue that two dimensions of absorptive capacity—acquisition and assimilation of external knowledge—relate to a firm’s potential absorptive capacity whereas two others—transformation and exploitation—relate to a firm’s realized absorptive capacity. Lichtenthaler (1990) integrates dimensions of learning to absorptive capacity and emphasizes the complementarity of learning processes and dynamic capabilities in turbulent environments. In the turbulent world of financial markets, the dynamic ability to absorb and exploit external knowledge of successful practices and of ever-changing market conditions would seem critical to investment performance.

Cohen and Levinthal (1990) explore whether absorptive capacity must be developed internally or whether it can be bought/borrowed. They build on earlier work by Aiken and Hage (1968) and Aldrich and Herker (1977) with regard to the role of “boundary spanners” or “gatekeepers” that bridge the gap in knowledge between internal personnel and external resources. In the field of institutional money management, investment consultants often serve as a bridge between external money managers and the college’s Investment Committee. Jones (2006) believes that change agents help to build absorptive capacity by “assisting others to recognize the benefits of adopting new ways of working.” A lack of absorptive capacity has been linked to organizational inertia (Welsch, Liao, & Stoica, 2001) and may relate to endowment performance in that
relatively poor-performing endowments have maintained lower levels of diversification whereas top performers have achieved goals of broader diversification.

METHODS

Methodological Approach

We conducted qualitative research based on semi-structured interviews to generate grounded or data-based theory (Glaser & Strauss, 1967). Grounded theory techniques are used to “generate a theory from the constant comparing of unfolding observations” (Babbie, 2007: 296). They facilitate the researcher’s understanding of issues and contexts prior to formulating a design model (Dick, 2000). Through open-ended questions they allow for greater exploration of factors and relationships than quantitative approaches typically can provide. We adopted a grounded theory approach to explore possible explanations for the significant disparity of investment performance between top and bottom groups within a sample of relatively small college and university endowments.

Sample

Financial officers at 20 of 92 U.S. colleges and universities with endowments in the $100 million to $200 million range and 10 years of reported performance data as of June 30, 2008 (NACUBO, 2008) participated in the study. We interviewed officers at 10 of 24 colleges in the top quartile and at 10 of 24 schools in the bottom quartile of that pool, thus providing substantial representation. By limiting the range of endowment size, we sought to significantly reduce the influence of size on endowment performance. In this particular asset range, endowment teams generally tend to increase their deliberations.
about portfolio diversification and staffing needs. As shown below, the 8% average annualized performance of the top-quartile performers in our pool was significantly better than the bottom-quartile performers, and it also exceeded the 7.6% rate of the $500 million to $1 billion category (Appendix B).

<table>
<thead>
<tr>
<th>TABLE 1</th>
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<tbody>
<tr>
<td><strong>10-Year Annualized Performance of U.S. Colleges with $100 to $200 Mil Endowments</strong></td>
</tr>
<tr>
<td>Average of 24 endowments in top quartile*</td>
</tr>
<tr>
<td>Average of 24 endowments in bottom quartile*</td>
</tr>
</tbody>
</table>

*Endowments with tied performance at quartile break-points were included in the top and bottom quartiles rather than in the avg category. Source: 2008 NACUBO Study.

Using the grounded theory approach, we adhered to the principles of appropriateness and adequacy (Glaser & Strauss, 1967) in respondent selection. To address appropriateness, 18 interviewees were either the highest- or second-highest ranking financial officer of targeted colleges/universities with partial oversight of the college’s endowment. At two institutions (one each from top and bottom groups) the interviewee was the president or chair of the foundation or board that is responsible for the endowment; we refer to the interviewees generically as top financial officers. In all cases, interviewees attended regular meetings of the Investment Committee and were very familiar with the policies and practices related to managing the endowment. The issue of adequacy was addressed by continuing to add respondents until theoretical saturation ensued. Nine of the interviews were obtained by using the researcher’s existing network of contacts for referrals within the targeted colleges and universities and the remainder by cold calls to the chief financial officer’s office. The 20 financial officers...
were from colleges and universities in 11 different states representing all regions of the
country.

**TABLE 2**
Sample Descriptions: Top and Bottom Quartiles

<table>
<thead>
<tr>
<th></th>
<th>Top Quartile</th>
<th>Bottom Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of States Represented</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Privately Funded College/Univ</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Publicly Funded College/Univ</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Male Interviewees</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Female Interviewees</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Average asset allocations differed significantly at June 30, 2008 between the 10
top-quartile and 10 bottom-quartile endowments, as shown below. Notably, top-quartile
study participants had smaller allocations to traditional equities and fixed income than
bottom-quartile participants, and larger allocations to hedge funds and other alternative
asset classes.

**TABLE 3**
Average Asset Allocations Top and Bottom Quartiles

<table>
<thead>
<tr>
<th></th>
<th>Trad'I Equities</th>
<th>Trad'I Fixed Income</th>
<th>Public Real Estate</th>
<th>Private Real Estate</th>
<th>Hedge Funds</th>
<th>Venture Capital</th>
<th>Private Equity</th>
<th>Natural Resources</th>
<th>Cash/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top Quartile</strong></td>
<td>42.6%</td>
<td>12.8%</td>
<td>2.8%</td>
<td>4.2%</td>
<td>24.9%</td>
<td>2.0%</td>
<td>4.9%</td>
<td>2.9%</td>
<td>2.9%</td>
</tr>
<tr>
<td><strong>Bottom Quartile</strong></td>
<td>62.5%</td>
<td>17.1%</td>
<td>2.7%</td>
<td>2.3%</td>
<td>6.7%</td>
<td>0.5%</td>
<td>2.0%</td>
<td>1.1%</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

Data are self-reported in NACUBO Endowment Study, 2008

**Data Collection**

Semi-structured interviews were conducted from May through October of 2009.
Nineteen interviews were conducted by telephone and one face-to-face interview
occurred in the interviewee’s office. Interviews averaged one hour. The researcher took
notes during the interviews and wrote a summary memo following each interview. All
interviews were recorded and subsequently transcribed by a professional transcriptionist. To ensure anonymity, transcriptions were stored on a computer with password-protected logon.

Interviewees were informed that the purpose of the interviews was to understand the investment management process and the people involved. The interviewer asked for interviewees to describe one or more particular instances in which endowment teams considered adding a new asset class to the portfolio. Probes consisted of asking who first suggested the idea, how the discussions evolved, what information was included, and how decisions were reached. Additional questions related to the governance structure for managing the endowment, the roles of the various participants, and the existence of other influences from either inside or outside the institution that affected the composition and performance of the portfolio. The convergent interview approach facilitated the gradual narrowing of the research focus (Boyatzis, 1998).

**Data Analysis**

Following the three stages of data analysis recommended by Strauss and Corbin (1998), we first conducted open coding. After reviewing the transcripts multiple times, we used MAXQDA software to identify “codable moments” or excerpts of potential salience and assigned brief descriptions to them. The 440 pages of transcripts yielded 1,056 codable moments and 120 codes. Certain codes were tied directly to the language of interviewees whereas others evolved from the researcher’s construction of concepts. In the second stage, axial coding, we organized data in new ways to seek relationships between codes. For example, we were able to establish a relationship between
“conservative risk orientation” and “narrow diversification” such that “conservative” endowment teams tended to refer to alternative investments as increasing risk. Another example of a relationship was that of “over-reliance on consultant” and “performance problems” wherein poor performers tended to hold their consultants responsible. In the third stage, categories of codes were identified as emerging themes whose relationships were then analyzed. The original 120 codes were reduced to five categories and 14 sub-categories.

TABLE 4
Categories and Sub-Categories from Interviews

<table>
<thead>
<tr>
<th>CATEGORIES AND SUB-CATEGORIES FROM INTERVIEWS</th>
<th>Top Quartile Totals</th>
<th>Bottom Quartile Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 top-quartile and 10 bottom-quartile performing endowments ($100 mil to $200 mil); 1998-2008</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Financial Officer’s View of Team’s Risk Beliefs
- Team is highly focused on overall portfolio risk management 8 4
- Financial officer refers to “conservative” committee or donors 0 6
- Alternative investments can reduce the endowment’s volatility 8 4
- Hedge funds are more risky than long-only stocks 1 7

Financial Officer’s References to Committee/Staff Expertise
- 3 or more investment experts on committee; at least 1 with alternative expertise 8 4
- Presence of at least one full-time investment expert on staff 3 0
- Belief that team has strong knowledge of alternative asset classes 7 2

Financial Officer’s References to Endowment Team’s Efficacy & Control
- Belief of the team’s ability to adopt successful practices of larger endowment 8 1
- Team compares its performance to peers of similar size 8 8
- Team compares its performance to $500 million-plus endowments 4 0
- Belief that committee feels ownership of decision-making 9 5
- Reference to inadequate due diligence before making bad investment 0 3

Officer’s Belief of Team’s Satisfaction with Consultant/Outsourcer 8 3

Financial Officer’s Evidence of Change Champion
- Evidence of person(s) who mobilized change > 10 years ago 5 0
- Evidence of person(s) who mobilized change 5-10 years ago 3 2
- Evidence of person(s) who mobilized change 2-4 years ago 0 3
- Evidence of person(s) who mobilized change < 2 years ago 1 1
Financial officers at 20 U.S. colleges and universities revealed significant differences between top-quartile and bottom-quartile endowment teams. Five distinguishing characteristics emerged from our data.

**Finding 1. Top-performing teams hold much stronger beliefs than do poor-performing teams that diversifying portfolios into alternative investments improves the overall risk/return profile of the endowment.**

Portfolio returns were rarely discussed by financial officers at schools with top performing endowments without concomitant reference to risk management and diversification. An officer at a top-performing endowment explained the benefits of diversification as follows:

The analogy I use with regard to diversification is Tiger Woods. Tiger is the acknowledged best golfer in the world, but he would never think of going around the golf course with one golf club. He has 14 clubs in that bag because that gives him multiplicity of capability depending on circumstance. You maintain that skill or those processes based upon what you encounter, and you see him manage his game. …diversification gives you the ability to actually lower your volatility and potential risk, and an opportunity to increase your overall return. (TQ-1)

Officers at both top- and poor-performing schools emphasized the importance of asset allocation in determining portfolio performance. Poor performers, however, described it narrowly, primarily as the relative proportion of traditional equities and fixed-income investments, whereas top performers reported it as a much broader range of asset classes that includes not only traditional equities and fixed income but also an array of alternative investments such as hedge funds, natural resources, private real estate and private equity.
**Finding 1.1. Eight of 10 top performers vs. only four of 10 bottom performers view alternative investments as valuable in reducing portfolio losses and volatility.**

Financial officers associated with top performing endowments referenced a variety of alternative investments that have provided diversification and downside protection (i.e., less decline than traditional equities during the dot.com crash and market collapse of 2008-09).

**FIGURE 1**
Top-Quartile Views Regarding Alternative Asset Classes and Risk Reduction

<table>
<thead>
<tr>
<th>Alternative Investments and Risk Reduction Top Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>We’ve had a gradual evolution over the years of reducing domestic equities and adding hedge funds... and they have helped to mitigate some of the losses that occurred starting in 2007. TQ-4</td>
</tr>
<tr>
<td>Our above-average allocation to alternatives has contributed to performance so it was a good move for us. It has also helped to lessen the volatility. TQ-2</td>
</tr>
<tr>
<td>When the market was crashing and burning, our oil and gas was going up. And so that helped level the portfolio out. It’s just another alternative investment for us that we’re fortunate enough to have quite a bit of…. And now we’re hoping in a couple years we’re going to be able to get some of these wind farms coming in. TQ-7</td>
</tr>
<tr>
<td>What’s happened, especially now that the market has gone down, is that the farmland has retained its value for the most part. TQ-3</td>
</tr>
<tr>
<td>You can diversify across many different asset fields and then you look at the portfolio in its totality, not in one asset or in one small area of assets. That gives you the diversification that can actually lower your volatility and your potential risk and give you an opportunity to increase your overall return. TQ-1</td>
</tr>
<tr>
<td>A long-only (traditional equity) portfolio seems more risky to us than a long-short (hedged) portfolio, TQ-9</td>
</tr>
</tbody>
</table>

**Finding 1.2. Seven out of 10 poorer performers (but only one top performer) view hedge funds as increasing risk relative to traditional equities.**
Endowment teams tend to have strong views about hedge funds, either for or against.

Financial officers at top-performing schools referred to the volatility-reducing characteristics of hedge funds such as market-neutral or absolute-return strategies. Exemplary expressions of aversion and/or disinterest in hedge funds by bottom-quartile teams are presented in Figure 2.

FIGURE 2
Bottom-Quartile Officers’ Views of Riskiness of Hedge Funds

<table>
<thead>
<tr>
<th>Hedge Funds Perceived as Increasing Risk (Bottom Quartile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know (committee members) look at alternative asset classes. But there’s a concern about how donors of (the college/university) will feel if we’re invested in a bunch of “goofy” things such as hedge funds. There have been potential donors who have called me and asked if we are invested in certain things and if we are, they won’t give. Again, we’re fairly conservative. BQ-8</td>
</tr>
<tr>
<td>There are two (committee members) that have (worked with firms that invest in hedge funds) but both of them do not personally invest their own money in them. So I think that tells a little bit of the story of the conservative nature of the people on our board. I’m not sure if they would ever put money in a hedge fund. BQ-9</td>
</tr>
<tr>
<td>Traditionally, the committee has been very conservative. We were not risk takers for many reasons, not just because of conservatism; we had not gotten very involved in alternative investments, hedge funds. BQ-7</td>
</tr>
<tr>
<td>For many of the committee members the word hedge fund meant problems and trouble and non-transparency, a host of issues they were concerned with. BQ-2</td>
</tr>
<tr>
<td>There are auditor questions in those hedge funds. The auditors don’t feel they’re really transparent, and so they have a level 3 confidence (rating) on them. The regular stocks and bonds are on level 1 because we can get an established market price at year end. But with level 3, (the market value) is essentially what the hedge fund says it is. My people understand risk, and when most of the money is for scholarships you’ve got to be conscious of risk. BQ-10</td>
</tr>
<tr>
<td>I think the investment advisory committee is still fairly conservative by nature. Alternative investments are the only place where advisory committee members might cringe, and if too many people are cringing about a hedge fund or other alternative strategy, then it pretty much gets killed in the committee before it goes anywhere. BQ-1</td>
</tr>
<tr>
<td>The committee discussed hedge funds about a year and a half to two years ago but they were still too concerned about the risk and so nobody was thrilled about it at all. BQ-6</td>
</tr>
</tbody>
</table>
Finding 2. Top-performing endowment teams recruit more investment professionals with a broader range of investment experience to serve on the investment committee than do poor-performing teams.

Officers at top-performing colleges reported more discretion in the selection of investment committee members than did peers associated with bottom-quartile endowments. All respondents affirmed the benefits of having professional expertise on their investment committees, but top-performing teams were reported to procure more experts than poor-performing teams. Three of the top-performing but none of the poor performing teams reported employing a full-time investment expert, two of which have the title of Chief Investment Officer. The quotes below provide stark contrasts in procured expertise between top and bottom performers.
Finding 3. Top-performing teams are significantly more confident of their ability to adopt successful practices of larger endowment teams than are poor-performing teams.

Eight of 10 officers affiliated with top performing endowments versus only one of 10 affiliated with a bottom performing endowment expressed confidence in their teams’ ability to outperform peers of similar size and to implement successful strategies of much larger endowments. Only three of the 10 top performers mentioned instances where their
small size has limited their ability to achieve strong results whereas six of the 10 bottom-quartile performers did. Four of the top performers compare themselves against $500 million-plus portfolios whereas none of the bottom-quartile category reported doing so.

**FIGURE 4**
Top-Quartile Officers’ Views of Endowment Team’s Efficacy

<table>
<thead>
<tr>
<th>Collective Efficacy (Top Quartile)</th>
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<tbody>
<tr>
<td>The college and committee have taken a very sophisticated approach to managing this pool of assets that’s probably not representative of other endowments of similar size. If you look at the NACUBO data and compare the average asset allocation of the $1 billion-plus endowments to ours, we look almost identical to that group as opposed to the $100-$500 million group. TQ-5</td>
</tr>
<tr>
<td><em>(Using the NACUBO study), we first benchmark ourselves against peers of similar size on such things as returns, number of managers, asset allocation, etc. Then we look at those billion dollar endowments and ask the same question—where are they, what are the things they are moving toward, and what are the things that we ought to be doing that they’re doing if their returns are significantly different than ours. TQ-4</em></td>
</tr>
<tr>
<td>When I look at the NACUBO data and see the results produced by these larger organizations, I wonder if you added up all their costs of having an expensive investment staff—salary, bonus, all the stuff they get—and took it against their returns, where would they be? I think they’d be worse than us. TQ-2</td>
</tr>
<tr>
<td>Everybody said you can’t do the alternative investments like Yale and Harvard because you’re not large enough to access certain private equity or venture capital or other kinds of investments. You won’t be able to get into hedge funds because you don’t have the due diligence and the staff capabilities to do that. You won’t be able to get into certain kinds of real asset mixes and natural resources. Yet we did it at $110 million, and it paid huge, huge dividends. TQ-1</td>
</tr>
</tbody>
</table>

Officers affiliated with poor performing endowments, in contrast, did not exude such confidence. As one reported, “We are small; we don’t have a large staff. The staff we have, and I include myself, are not investment experts by any means.” (BQ-7)

Another said that comparisons with very large endowments are irrelevant: “Yale and Harvard endowments are so much bigger and different from ours…we don’t really try to compare ours to theirs or necessarily look at what they are doing.” (BQ-6)
Finding 4. Top-performing teams are more independent in decision-making whereas poor-performing teams rely much more heavily on investment consultants and are more apt to hold consultants responsible for endowment performance.

Nine of 10 top performers but only five of 10 bottom performers were reported to have a strong sense of independence and control over the major decisions affecting their endowments. Seventeen out of the 20 schools in our sample had worked with either consultants or outsourcers for most or all of the past 10 years. Top performers expressed greater satisfaction and reported longer tenure with consultants than did bottom performers. The majority of officers from both groups said consultants are helpful in providing manager searches and performance monitoring, but differed in describing the degree of influence the consultant has on the investment committee’s portfolio decisions. Five of the 20 colleges delegate management of the majority of their assets to a firm in an arrangement called “outsourced Chief Investment Officer” wherein the outsourcer has varying degrees of discretion over diversification and choice of managers for delegated assets. Two of the three top performers who outsource provided evidence that their teams maintain considerable influence over directions the outsourcer takes; the third top team was reported to be less involved with the bulk of the assets but maintained considerable control over a natural resources allocation. The two poor performing teams previously had little involvement with their outsourcers but in recent years have become more engaged with them.
Finding 5. Change champions are more prevalent on top performing than poor performing endowment teams and tend to be more persistent about their causes.
Both top and bottom teams recognized and emphasized the positive benefits that change champions had initiated. A significant difference between the two groups was that 10 out of 11 champions described by top performers (including multiple champions at the same college in some cases) worked on changes beginning more than five years ago whereas only three of the bottom performers’ seven champions did so. (See Appendix C for details.)

A financial officer from the bottom-quartile group explained how the college’s president recently championed the need for a consultant: “She was looking at the fact that we had been consistently underperforming compared to peer groups. She probably had conversations with other presidents and then…. (presented a) challenge to the group to fess up that they’ve been underperforming a bit and ought to ‘snap to.’” Changes reported as most frequently championed by both groups included broader diversification, hiring a new consultant, and seeking greater expertise on the committee. Champions were revealed to include committee and board members, consultants, CFOs and other college administrators.
FIGURE 6
Top-Quartile Examples of “Championing” Behavior

When I first started almost 15 years ago we had a finance committee that also included auditing and investments. Then when Sarbanes Oxley hit I went to the president and the chair of the board and said I think we need to split out the audit committee, and the endowment is large enough now that we also need a separate investment committee. They agreed. I was also able to persuade them to consider allowing investment experts to join the committee that were not board members. TQ-4

The President of the university was pretty instrumental in leading the initiative to get a consultant several years ago. He was greatly embarrassed by the notoriety of our poor performance and he was the one that really pushed the board to consider bringing in an outside consultant. TQ-3

In about 2002, we were doing an evaluation of our investment process and our projections. We determined that a traditional asset allocation wasn’t going to give us the kind of capabilities and the resources necessary that we would need to advance the mission of the university. So we set out on a course toward getting a very diversified kind of a portfolio, which is what we have done. TQ-1

About seven years ago we hired our consultant and he has really helped a lot in that he consistently brings up things to think about. Once he was brought on board, the committee got used to thinking about the asset allocation model and ways to improve it, rather than just sitting and listening to performance reports. TQ-10

As new committee members came on a number of years ago they evidently brought a broader perspective to investment management and started asking questions as to whether we should be considering more asset classes. The consultant would provide research or educational sessions to bring them up to speed on what’s going on in the market in a particular strategy or particular asset class. It was a two-way conversation, probably led more by the investment committee than by the consultant. TQ-5

DISCUSSION

Research on college endowment performance has focused extensively on predictors such as asset size, asset allocation and manager selection, and has paid scant attention to the personal characteristics and judgments of decision makers. We began our inquiry about factors that influence college endowment performance conjecturing that absorptive capacity might play a salient role. Absorptive capacity is helpful in understanding how an organization’s existing relevant knowledge contributes to its
ability to obtain and exploit new knowledge (Zahra & George, 2002). Our data supported the criticality of a team’s existing knowledge (or expertise) as a contributor to new knowledge acquisition and performance, but, in addition, yielded vivid evidence of other salient characteristics separating top and bottom performers.

Top-performing endowment teams were described by their financial officers as having a much stronger sense of their own abilities (i.e., efficacy) than poorer performing teams. Although initially referencing individuals rather than teams, Bandura (1977) defined efficacy as a person’s perception of his/her ability to cope, perform and succeed. Later he argued that beliefs in efficacy can influence one’s choice of undertakings, the degree of effort put into the endeavor, the level of perseverance and responses to failure (Bandura, 2001). The theory has since been extended to groups, reflecting members’ beliefs in their ability as a whole to perform effectively (Lindsley, Brass, & Thomas, 1995; Bandura, 2002).

Financial officers associated with top-performing endowments in our study referred to their team’s perceptions of their ability to adopt many of the sophisticated investment approaches of large endowments and, in so doing, to overcome challenges related to the size of their own endowments to achieve similar results. Our data suggest that top performing teams have demonstrably higher collective efficacy than poorer performing teams.

Top-performing endowment teams also were reported to evidence a strong sense of personal and collective agency, which, as argued by Bandura (2002), attests to their capability to exercise control over events and over their own actions. Collective agency,
as defined by Bandura, is not simply the product of each person’s knowledge and skills but also the inter-relationship of those abilities. The links between efficacy and agency are such that Bandura states that “efficacy beliefs are the foundations of human agency.” Top-performers were described as exercising much more ownership and independence with regard to decision making than were poor performers who, by relying heavily on consultants in making decisions, engaged in what Bandura (2001) called proxy agency, or the delegation of agency to others. Their success, therefore, was tied to their ability — or their luck — in selecting a capable consultant or outsourcing firm.

The assumption of responsibility for investment decisions – or delegation of it to others – by top vs. poorer performing teams respectively implies differences in collective locus of control. Locus of control, a construct defined by Rotter (1966) to describe attribution of responsibility for outcomes – either internal (self) or external (others or forces beyond one’s control) – has similarities to efficacy and agency in that it is strongly associated with individuals’ feelings of potency and being “masters of their own fate” (Boone et al., 2005). Those with a strong sense of potency are referred to as having an internal and those with a low sense of potency an external locus of control. A meta-analysis of several dispositional traits has indicated that locus of control and generalized self-efficacy are significant predictors of job performance (Judge & Bono, 2001).

Top-performing endowment teams in our study were reported to exude strong confidence in their ability to influence outcomes and to be highly motivated to succeed. Motivation is exhibited by work effort and task orientation (Spector, 1982). We found that high levels of work effort, often referred to in our data as due diligence, were also
associated with top-performing endowment teams. Diligence was evidenced in narratives about energetic searches for new consultants or money managers and engagement in intensive analyses of new asset classes or investment strategies. These behaviors all point to high internal locus of control. In contrast, poorer performing teams were more likely to exhibit external locus of control, demonstrated by propensities to be easily influenced by their consultants and less motivated to engage in extensive due diligence. While the top performing teams were reported to voice responsibility for endowment performance, less successful teams assigned blame for poor investment results on consultants or others.

Another striking difference between top and bottom performers was their perception of risk related to the inclusion of alternative investments in their endowment portfolios. According to Sitkin and Pablo (1992), risk is associated with the extent to which decision makers face “uncertainty about whether significant and/or disappointing outcomes of decisions will be realized.” Risk perception relates to individuals’ assessment of the risk inherent in a given situation (Sitkin & Pablo, 1992). Lennart Sjoberg (2004) defined it as “the subjective assessment of the probability of a specified type of accident happening and how concerned we are with the consequences.” Since risk perception has been shown to be a powerful predictor of asset allocation with greater explanatory effect than expected volatility (Weber, Siebenmorgen, & Weber, 2005), understanding factors related to risk perception appears particularly relevant to this inquiry. Sjoberg suggests that risk perceptions are derived from both realistic and unrealistic assessments about the riskiness of a situation and that people with related
experience tend to make more realistic assessments (Sjoberg, 2000). The lack of related experience or “domain familiarity” may lead to inaccurate assumptions about the inherent risks and thus limit the ability to make knowledge-based decisions (Jemison & Sitkin, 1986; Tversky & Kahneman, 1973).

Researchers warn, however, that problems can result from either too little or too much familiarity with the problem/situation. While individuals with minimal related experience may hold risk perceptions based on very limited information (Tversky & Kahneman, 1973), decision makers with extensive experience may be more likely to focus on their own abilities and past successes rather than on current situational constraints (Jemison & Sitkin, 1986). Unrealistic risk perceptions also may stem from overly-optimistic and overly-pessimistic attitudes. Excessive optimism is associated with delusions of control and denial of risk while excessive pessimism is associated with timidity and paralysis (Kahneman & Lovallo, 1993). Vividness of an outcome also has been associated with risk perception (Kahneman & Tversky, 1979). Unrealistic risk perceptions have also been linked to the tendency of individuals to treat decisions as unique and thus neglect historical statistics as well as future opportunities. Researchers label these situations as isolation errors that do not adhere to the rational model of economics (Kahneman & Lovallo, 1993). Two types of isolation errors have been identified: overlooking the benefits of risk pooling and making overly optimistic forecasts based on plans for success. Researchers have suggested that decision makers should aggregate their concurrent choices before making decisions and should look at outcomes as a whole rather than in terms of the gains and losses associated with each
decision (Kahneman & Lovallo, 1993). This suggestion sounds remarkably similar to that of Modern Portfolio Theory and corresponds to poor-performing endowment teams’ emphasis on individual investments versus top performers’ emphasis on the overall portfolio. Poor performers in this study appear more likely to overlook the benefits of risk pooling through broader portfolio diversification.

Attitudes and feelings also have been suggested to affect risk perception, reflecting Sjoberg’s (2000) observation that “people tend to see mostly good properties of those concepts or objects that they like and mostly bad properties in those that they dislike.” In our study the attitudes and feelings about hedge funds by endowment teams appeared to affect their perception of hedge-fund risks.

Lastly, loss aversion can affect how people make decisions involving risk. Loss aversion refers to observations that losses are weighted more than gains; it favors inaction over action and the status quo over any alternatives (Kahneman, 1991). Loss aversion also implies that people value what they have more than “comparable” things they do not have (Levy, 1992); this over-evaluation of current possessions has been called the “endowment effect” (Kahneman, Knetsch & Thaler, 1991). The fact that six officers from bottom-quartile endowments referred to their teams or donors as “conservative” (while none of the top quartile did so) appears to indicate a higher degree of loss aversion and preference for the status quo as compared to top performers. Unfortunately, the poorer performers’ greater aversion to loss did not translate to lower losses; instead, bottom-quartile performers were far more likely to speak of serious losses incurred from
over-concentration of technology stocks during the dot.com crash, over-concentration of financial stocks during the credit crisis, and instances of being fraud victims.

Overall, our data suggest dramatically different characteristics of top and bottom performing college endowment teams. Top performers have greater experience and knowledge with a variety of asset classes, have a greater sense of their abilities to perform well, and believe they have more control over actions and outcomes. Their greater experience and prior success with alternative investments may have contributed to their perceptions that the inclusion of them in a portfolio reduces its overall risk. Their lower perceived risks, in turn, influence the allocation of higher percentages of their portfolios in alternative investments. Poor performers, on the other hand, have relatively less experience and knowledge of alternative investments, are less confident of their abilities, and assign greater responsibility over portfolio performance to their consultants or outsourcers. Their lack of domain familiarity and their attitudes may contribute to their preference for the status quo, which corresponds to their relatively larger allocations to traditional asset classes.

One could conjecture that top performers’ greater domain familiarity, supplemented by knowledge and expertise from their consultants, contributed to more realistic risk perceptions and that those perceptions influenced their more successful portfolio compositions. However, it is also possible that their risk perceptions about alternative investments provided favorable results for only a limited period that may not continue in different market environments. Luck may have played a significant role in the matchup of top performers’ portfolio decisions and performance results.
Another salient research finding pertained to the presence (or absence) of change champions. Top-performing endowment teams indicated that change champions played important roles in achieving broader portfolio diversification. Interestingly, champions were not tied to any particular position and included committee members, consultants, financial officers, board chairs and college presidents. Research on champions has focused substantially on the domain of innovation; champions have been described as “identify(ing) with the idea as their own, and with its promotion as a cause, to a degree that goes far beyond the requirements of their job” (Schon, 1963). Burns (1978) has compared championing behaviors to those of transformational leaders—those who inspire others to look beyond their own self-interests for a higher collective purpose. Empirical research by Howell and Higgins (1990) has shown significant differences in personality characteristics between champions and non-champions, with champions manifesting risk-taking and innovativeness as predominant characteristics.

Champions in our study were described as having a vision of improving investment performance for the good of the college community. They would go to great lengths to provide educational sessions (involving consultants and other experts) about portfolio modeling and the contributions of alternative asset classes to improve the risk/reward profile of the portfolio and they showed great perseverance in achieving goals. Champions, who exhibit high self efficacy and strong internal locus of control, were described as instrumental in bringing about positive changes and the sooner they got started, the greater the benefits.
In sum, our data suggest that personal and team characteristics may provide substantial explanation for endowment decision-makers’ risk perceptions of alternative investments and resulting investment decisions. These characteristics appear to compliment absorptive capacity, the organizations’ ability to acquire, assimilate, transform and exploit external knowledge to commercial benefit. Institutional theory, while enlightening in its explanation of typical diffusion of new practices throughout an industry, did not apply in its rigid form since top performers did not blindly adopt practices of large endowments but rather only after extensive due diligence, and poor performers were more likely to ignore them. Although we appreciate the potential dangers of over-confidence and excessive optimism on the part of endowment decision-makers, these were not evident in the narratives of top performers or in their 10-year performances. Whether their experience, confidence and risk perceptions will continue to serve them well over time remain to be seen.

The assumed effects of team characteristics and consultant knowledge on portfolio decisions and endowment performance are depicted in the conceptual model below. The model suggests that expertise (defined as including both relevant knowledge and experience), efficacy, agency, locus of control, and consultant knowledge affect risk perception. Presence of “Championing” is suggested to moderate this influence.

The performance measure in the model is labeled “Relative Performance” because our interest in performance is from a relative standpoint; performance data of one investor or one investment team provided in isolation offer little insight about quality unless they are compared to other investors’ or index performance. In addition to relative
performance, a second dependent variable, team satisfaction, indicates the degree to
which endowment teams are satisfied with their portfolio decisions over the measurement
period. Overall, top performers were generally satisfied with their performance relative to
their benchmarks, given the market conditions over the 10-year period, whereas bottom
performers were disappointed. Consultants were credited by top performers for providing
information and aiding understanding of the risk/return profile of alternative asset classes
and the overall portfolio. Bottom performers were far more likely to indicate that their
consultants failed to mitigate losses and thus harmed their endowments’ performances.
Considerable research in product and service industries has revealed that performance
and disconfirmation are significant determinants of satisfaction (Patterson, Johnson, &
Spreng, 1997). Disconfirmation -- defined as the discrepancy (either positive or
negative) between what was expected and what was received-- has been found to be a
dominant determinant of client satisfaction with professional consultants (Patterson et al.,
1997). During the timeframe analyzed, one might conjecture that knowledgeable
consultants did a better job than less knowledgeable consultants in helping endowment
teams establish realistic expectations, which may have helped to close the gap between
expectations and results, thus leading to greater satisfaction. Our findings suggest that
more realistic expectations (including more realistic risk perceptions) about the benefits
of alternative investments in reducing volatility (and especially in reducing losses in
down markets) contributed to stronger performance and greater team satisfaction.
LIMITATIONS

Several limitations of the research should be noted. The 20 colleges included in the study may not be representative of the 48 U.S. schools in their quartiles in the total endowment class of 92 schools. In addition, they may not be representative of colleges that do not participate in the study. Study participants receive fuller access to NACUBO findings than non-participants and so the former may be more cognizant of and influenced by the performance and asset allocations of their participating peers. Another limitation relates to the fact that market dynamics favor different asset classes over different periods of time. Therefore, investors with certain longer-term approaches may outperform or underperform depending upon market conditions, and a 10-year period
may not be sufficient to capture an investor’s performance over different types of market cycles.

Most of the interviewees were college/university chief financial officers who may have a different perception of the endowment decision-making process than other parties such as Investment Committee members, other officers of the institution, consultants, professional money managers, etc. Thus, the perspective is limited to one type of participant in the endowment management process.

A concerted effort was made to mitigate any effects of researcher bias stemming from the researcher’s considerable experience with investment management. This bias may have been lessened by substantial input from content and methods advisers in developing the interview protocol and in making revisions after reviewing transcripts of initial interviews.

IMPLICATIONS FOR PRACTICE AND FUTURE RESEARCH

This study could be extended to examine investment management practices at many different types of organizations that manage portfolios, and particularly those with volunteer Investment Committee members. Given the emphasis placed on team expertise, college and university fiduciaries would likely benefit from careful selection of investment committee members to ensure sufficient knowledge of diverse asset classes. Researchers have found a positive correlation between endowment performance and higher-performing student bodies as measured by SAT scores (Lerner, Schoar, & Wang, 2008). College fiduciaries may want to reconsider policies and practices so that non-alumni individuals with investment expertise could serve on the committee. This would
seem particularly important in smaller cities or college towns where the pool of investment professionals is limited. Other beneficial characteristics of potential candidates could include a sense of efficacy, agency and internal locus of control. These traits appear to enhance the team’s desire for achievement and its sense of control and responsibility over decisions. As certain researchers cautioned, however, it is important to avoid extreme over-confidence since that may instill decision makers with a sense of infallibility. Our findings also indicated that top financial officers can play important roles in effecting improvements and they should be incented to do so.

Careful attention also should be given to the selection of investment consultants, including a clear understanding of their knowledge and experience with diverse asset classes and with investment managers that have demonstrated strong track records. With regards to portfolio construction, we suggest that endowment teams focus significantly on the risk/reward profile of the overall portfolio so that it is in keeping with the college’s goals and risk orientation. Teams may be well-advised to analyze the risk perceptions they have about particular asset classes and their role in portfolios and to juxtapose those perceptions with historical data in various market environments. We do not advise adding any asset class or investment without significant understanding and due diligence, but suggest that teams employing very minimal diversification could benefit from learning about additional asset classes.

Since endowment teams’ risk perceptions played such a significant role in their portfolio allocations, additional research into factors affecting those perceptions would seem valuable. And since team satisfaction has been associated with discrepancies
between expectations and actual results (known as disconfirmation), a particular focus on practices that could diminish those discrepancies would appear warranted.

**APPENDIX A**

**College Endowment Asset Allocations by Category Size**
*(NACUBO Endowment Study, 2008)*

<table>
<thead>
<tr>
<th>Investment Assets</th>
<th>Equity %</th>
<th>Fixed Income %</th>
<th>Hedge Funds %</th>
<th>Private Equity %</th>
<th>Real Estate %</th>
<th>Natural Resources %</th>
<th>Venture Capital %</th>
<th>Cash/Other %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater Than $1 Bil</td>
<td>39.4</td>
<td>10.8</td>
<td>22.6</td>
<td>10.0</td>
<td>6.4</td>
<td>5.3</td>
<td>3.6</td>
<td>1.9</td>
</tr>
<tr>
<td>&gt; $500 Mil to ≤ $1 Bil</td>
<td>42.5</td>
<td>14.6</td>
<td>19.2</td>
<td>7.7</td>
<td>6.1</td>
<td>3.5</td>
<td>2.8</td>
<td>3.6</td>
</tr>
<tr>
<td>&gt; $100 Mil to ≤ $500 Mil</td>
<td>50.4</td>
<td>16.5</td>
<td>16.4</td>
<td>4.3</td>
<td>4.1</td>
<td>3.0</td>
<td>1.2</td>
<td>4.2</td>
</tr>
<tr>
<td>&gt; $50 Mil to ≤ $100 Mil</td>
<td>54.1</td>
<td>20.3</td>
<td>11.5</td>
<td>1.8</td>
<td>4.2</td>
<td>1.9</td>
<td>0.5</td>
<td>5.8</td>
</tr>
<tr>
<td>&gt; $25 Mil to ≤ $50 Mil</td>
<td>57.6</td>
<td>20.8</td>
<td>10.4</td>
<td>1.0</td>
<td>4.1</td>
<td>1.2</td>
<td>0.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Less Than or Equal to $25 Mil</td>
<td>55.9</td>
<td>27.1</td>
<td>3.3</td>
<td>0.6</td>
<td>2.2</td>
<td>0.4</td>
<td>0.3</td>
<td>10.2</td>
</tr>
<tr>
<td>Equal-Weighted Avg</td>
<td>51.9</td>
<td>19.2</td>
<td>12.9</td>
<td>3.3</td>
<td>4.1</td>
<td>2.2</td>
<td>1.1</td>
<td>5.4</td>
</tr>
</tbody>
</table>

**APPENDIX B**

**College Endowment Performance by Category Size, 1998-2008**

*Source: NACUBO Endowment Study, 2008*
## APPENDIX C
Championing Activities of Top and Bottom Quartile Endowment Teams

<table>
<thead>
<tr>
<th>Evidence of Championing for Improvements</th>
<th>Top-Quartile</th>
<th>Bottom-Quartile</th>
<th>&gt; 10 yrs ago</th>
<th>5 to 10 yrs ago</th>
<th>2 to 4 yrs ago</th>
<th>&lt; 2 yrs ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broader Diversification, More Expertise</td>
<td>TQ:1 Foundation Pres</td>
<td>BQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broader Diversification</td>
<td>TQ:2 Consultant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiring Consultant for First time</td>
<td>TQ:3 President</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broader Diversification</td>
<td>TQ:3 Consultant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broader Diversification, More Expertise</td>
<td>TQ:4 CFO</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broader Diversification</td>
<td>TQ:5 Committee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiring New Consultant</td>
<td>TQ:6 Committee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broader Diversification</td>
<td>TQ:7 Consultant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiring Consultant for First Time</td>
<td>TQ:7 Committee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiring manager for Hedge Funds</td>
<td>TQ:9 Committee</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiring New Consultant</td>
<td>TQ:10 Committee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adding more expertise to committee

<table>
<thead>
<tr>
<th>Evidence of Championing for Improvements</th>
<th>Top-Quartile</th>
<th>Bottom-Quartile</th>
<th>&gt; 10 yrs ago</th>
<th>5 to 10 yrs ago</th>
<th>2 to 4 yrs ago</th>
<th>&lt; 2 yrs ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adding more expertise to committee</td>
<td>BQ:1 Committee Ch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adding hedge funds to portfolio</td>
<td>BQ:2 Consultant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adding more expertise to committee, education</td>
<td>BQ:3 CFO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broader diversification</td>
<td>BQ:4 Board chair</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiring consultant for first time</td>
<td>BQ:5 Committee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broader diversification</td>
<td>BQ:5 Consultant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiring consultant for first time</td>
<td>BQ:9 President</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Indicates two examples from same school.*
REFERENCES


APPENDIX H
Quantitative Research Report Using Portfolio Theory

UNIVERSITY ENDOWMENT COMMITTEES, MODERN PORTFOLIO THEORY AND PERFORMANCE

By

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EDM/Mandel Center Fellow

Submitted in Partial Fulfillment of the Requirements for the Quantitative Research Report in the Doctor of Management Program at the Weatherhead School of Management

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CASE WESTERN RESERVE UNIVERSITY

December 2010
UNIVERSITY ENDOWMENT COMMITTEES, MODERN PORTFOLIO THEORY AND PERFORMANCE

ABSTRACT

University endowments with broad portfolio diversification have been correlated with performance, but antecedents to investment committees’ diversification decisions have not been tested previously. Investment committee characteristics including diverse investment expertise, a learning commitment and open-mindedness are postulated to affect portfolio diversification via the committee’s use of Portfolio Theory principles. The use of Portfolio Theory framework leads to greater portfolio diversification, which, in turn, leads to higher risk-adjusted returns.

Key words: portfolio theory; portfolio diversification; open-mindedness; learning commitment; expertise; performance; decision process.
INTRODUCTION

Starting with Harry Markowitz in the early 1950s, studies in finance have demonstrated how diversified investment portfolios contribute to risk-adjusted performance (Markowitz, 1952, 1959; Rubenstein, 2006; Fabozzi, Kolm, Pachamanova, & Focardi, 2007; Elton, Gruber, Brown, & Goetzmann, 2010). Although studies in behavioral finance have explored investor characteristics and behaviors that affect individual portfolios (Thaler, 2005; Statman, 2010; Barber & Odean, 2006; Kahneman & Tversky, 2000; Goetzmann & Kumar, 2008), relatively little is known about group factors that affect portfolio allocations and performance for institutional investment portfolios (such as pensions, educational and other charitable funds).

To address this gap in the literature, we explore how attributes and practices of decision-making committees, typically consisting of volunteers who meet several times a year, affect portfolio diversification and performance. Informed by studies outside of the investment industry regarding group characteristics that affect decision-making (Janis, 1972; Amason, 1995), as well as our own field work (Lord, 2010), we examine how university investment committees’ background, learning commitment and open-mindedness contribute to portfolio diversification and performance. Markowitz’s Portfolio Theory framework is proposed as an intermediary of the effect of committee characteristics on endowment diversification, which, in turn, is expected to have a direct effect on risk-adjusted performance.

Understanding determinants of portfolio performance is critical for college and university leaders since the endowment’s returns can profoundly affect the amount of
student financial aid, administrative staff size, facilities maintenance, programming, and mix of tenure-track and adjunct faculty (Brown, Dimmock, Kang, & Weisbenner, 2010). Investment performance of university endowments has taken on added significance due to the recent recession-induced declines in financial markets, donor giving and state allocations to higher education.

The trend toward broader diversification of endowment portfolios is grounded in Modern Portfolio Theory, more recently referred to simply as Portfolio Theory. The theory, based on mean-variance analysis (Markowitz, 1952, 1959), provides a framework for constructing portfolios that balances the twin goals of performance and risk management. Specifically, the theory posits that diversification promotes efficient portfolios that either: a) provide greater returns given a specified risk level; or b) reduce risk for a specified level of return. A number of software programs have been developed to help investors optimize the risk-return profile of their portfolios, with recommended asset allocations given their goals and constraints.

This study focuses on the investment committee since it is the body that establishes investment objectives and makes asset allocation decisions for 74% and 77% of university endowments, respectively (National Association of College and University Business Officers, 2008). We will develop and test hypotheses regarding group characteristics and processes that lead to greater portfolio diversification and higher risk-adjusted returns.

Endowment portfolios have become increasingly diversified in recent years across geographic regions and asset classes, as shown in Table 1.
As recently as 1993, the average U.S. endowment participating in the annual survey by NACUBO (2002-2008) had allocated 87% of its portfolio to traditional asset classes of fixed income and publicly-traded equities (U.S. and international), 9% to cash and “other,” and only 4% to alternative investments defined as hedge funds, private equity, real estate, venture capital and natural resources. By fiscal year-end 2008, the average allocation to alternative investments had grown to 23.7% with hedge funds claiming over half of the alternative allocation. Other notable changes over the 15 years are larger allocations to international equities (with smaller allocations to U.S. equities) and smaller allocations to fixed income.

Asset allocations differ remarkably by size of portfolio: in 2008, the largest endowments (those with portfolios greater than $1 billion) had allocated 48% to alternative investments whereas the smallest endowments (less than $25 million) had allocated just 7% to those investments. Researchers caution against naive imitation of large endowments’ asset allocations because alternative assets vary considerably in their
performance, and expertise is required to make good decisions (Lerner et al., 2008).

Investors also need to be aware of illiquidity risks associated with private investments (Brown et al., 2010). Leibowitz, Bova and Hammond (2010) have demonstrated that the benefits of endowments’ allocations to alternative investments are derived predominantly from the additional return expectations rather than from reduced volatility, because the addition of alternative investments has little effect on long-term portfolio volatility.

Previous research on university endowments has consistently found correlations between portfolio size and performance, and between portfolio size and diversification (NACUBO, 2002-2008). In a novel approach, we focus on factors that contribute to greater diversification and stronger portfolio performance among endowments of similar size. This approach provides improved isolation of the factors that are hypothesized to have positive effects on diversification and performance, irrespective of the portfolio’s size. Other endowment research has established links between performance and access to top managers, good timing of investments, “Ivy League” status, greater alumni giving, higher student-body SAT scores, and the ratio of endowment dollars per student (Lerner, Schoar, & Wang, 2008). Yet those findings provide few actionable steps for the endowment team in attempting to improve performance. Our research question is a practical one that has not been examined empirically: How can colleges/universities foster an environment that leads to broad diversification and higher risk-adjusted returns of their endowment portfolios? We argue that selecting investment committee members with expertise in diverse asset classes, promoting an open-minded learning environment,
and employing the principles of Portfolio Theory can play key roles in reaching those objectives, as conceptualized in Figure 1.

**FIGURE 1**
Conceptual Model 1

**THEORY AND HYPOTHESES**

**Diverse Committee Expertise**

Researchers have found that a broad base of knowledge from multiple perspectives provides organizations with greater ability to access and absorb new knowledge (Cohen & Levinthal, 1990; Zahra & George, 2002; Forbes & Milliken, 1999; Wadhwa & Kotha, 2006), greater flexibility and adaptability to environmental change (Lewin & Volberda, 1999); increased creativity (Hoffman & Maier, 1961); and improved decision quality (Amason, 1996). Horwitz and Horwitz (2007) found that teams’ task-related diversity, as distinguished from bio-demographic diversity, has a significant positive effect on performance, measured both by quality and quantity.
Organizational capability is based on the integration of individuals’ specialized knowledge (Grant, 1996).

Research on individual investors substantiates the link between investment expertise or “sophistication” and portfolio diversification (Goetzmann & Kumar, 2008). Investor characteristics that limit portfolio diversification may include narrow framing of investment decisions (Kahneman & Lovallo, 1993; Barberis, Huang, & Thaler, 2006; Kumar & Lim, 2008); risk perceptions (Weber, Siebenmorgen, & Weber, 2005; Sjoberg, 2000) and a preference for familiar investments called “home bias” or “domain familiarity” (Graham, Harvey, & Huang, 2009; Jemison & Sitkin, 1986; Tversky & Kahneman, 1973). The literature supports the view that investment committees with expertise in a variety of asset classes would have broader framing of investment selections and develop more diversified portfolios than teams lacking diverse investment experience. Committees with greater expertise also could be expected to be more familiar with decision frameworks such as Portfolio Theory that promote the use of low- or non-correlated assets and lead to more diversified portfolios. We posit the following hypotheses:

Hypothesis 1. Committee expertise in diversified asset classes will have a positive effect on portfolio diversification.

Hypothesis 2. Greater committee expertise in diversified asset classes will contribute to greater use of Portfolio Theory as a decision-making framework.

Learning Commitment

Learning theory postulates that knowledge is a key source of competitive advantage (Grant, 1996) and organizational learning is recognized as a strategic resource
within the resource-based theory (Smith, Vasudevan, & Tanniru, 1996). An organization’s commitment to learning is related to the value that it holds toward learning (Sinkula, Baker, & Noordewier, 1997); learning commitment is related to Senge’s (1990) learning principles and Tobin’s (1993) expression of “thinking literacy.” As stated by Senge (1990), “The organizations that will truly excel in the future will be the organizations that discover how to tap people’s commitment and capacity to learn at all levels in an organization.”

Learning leads to knowledge, which, when communicated, allows for the organization of activities (Kogut & Zander, 1996). Organizational learning may facilitate changes in behavior that lead to improved performance (Slater & Narver, 1995). Similarly, learning can facilitate the discovery of superior knowledge and a focused inquiry into how the results of “best practices” can be obtained and transferred (Szulanski, 1996). The presence of knowledge led to utilization of knowledge in a study of IT and line managers in large organizations (Boynton, Zmud, & Jacobs, 1994). Lastly, the structural aspect of learning posits that an organization’s ability to implement behaviors is suggested by the wisdom it accumulates (Garvin, 1993). In our fieldwork (Lord, 2010), financial officers at top-performing endowments reported that investment committees had engaged in intensive educational sessions about asset classes not previously held in the portfolio before feeling comfortable about making investments in them. Thus, we propose:

Hypothesis 3. The committee’s commitment to learning has a positive effect on the use of Portfolio Theory as a framework for portfolio decision-making.
**Hypothesis 4.** The committee’s commitment to learning has a positive effect on portfolio diversification.

**Open-mindedness**

Open-mindedness is the ability of the organization to question members’ biases and assumptions, and to be open to new approaches (Calantone, Cavusgil, & Zhao, 2002). Individuals’ mental models, which are deeply held beliefs or images of how things work, limit them to familiar ways of thinking and behaving (Day & Nedungadi, 1994; Sinkula et al., 1997). Over time, these models may lose their efficacy if they are not questioned and altered (Day, 1994, Sinkula, 1994). High-performing organizations may benefit from a relatively high level of disagreement as a result of closer inspection of assumptions and alternatives (Janis, 1972; Slater & Narver, 1995). Thus, open-mindedness is related to cognitive conflict in which diverse perspectives are debated through such techniques as devil’s advocacy and dialectical inquiry, resulting in higher-quality decisions (Amason, 1996). The process of synthesizing diverse perspectives of team members is considered superior to the individual perspectives alone (Mason & Mitroff, 1981; Schweiger & Sandberg, 1989).

In group settings involving investment decisions, herding behavior has been evidenced when managers are primarily concerned about their reputations, and can be lessened when the emphasis shifts to profits (Scharfstein & Stein 1990). Financial officers interviewed in our qualitative study (Lord, 2010) spoke of the importance of vigorous debate among endowment team members in order to avoid “group think” and situations where a dominant personality could otherwise have undue influence on decisions. Decision-makers frequently differ in their perceptions of the potential risks
and returns of various investments. Thus, it seems reasonable that the critical assessment of assumptions, biases and approaches would lead to better outcomes through the decision-making framework of Portfolio Theory, which incorporates considerations for both risks and returns. We propose:

_Hypothesis 5. Open-mindedness among committee members contributes positively to the use of Portfolio Theory framework._

**Portfolio Theory**

Portfolio Theory provides a framework for making portfolio decisions that simultaneously considers risks and returns (Fabozzi, Gupta, & Markowitz, 2002). The theory holds that, in structuring a portfolio from a set of assets, investors need to estimate: a) the expected returns of the investments; b) the expected variance (standard deviation) of returns; and c) the expected covariance (or correlation) of returns (Michaud & Michaud, 2008). Building on Markowitz’s theory, the Capital Asset Pricing Model (CAPM) was developed by Sharpe, Lintner and Mossin and became a standard for measuring professional asset management (Fabozzi et al., 2007).

On the fiftieth anniversary of the development of Portfolio Theory, Markowitz described it as “a framework to construct and select portfolios based on the expected performance of the investments and the risk appetite of the investors…” (Fabozzi et al., 2002). He elaborated on the risks of holding highly correlated assets: “…if any one single investment goes broke it is very likely, due to its high correlation with the other investments, that the other investments are also going to go broke, leading to the entire portfolio going broke” (Fabozzi et al., 2002).
Implementation of Portfolio Theory can be fraught with dangers related to mis-
estimations for the inputs of expected returns, variance of returns, and correlations of
returns; egregious applications of the theory have occurred because of inappropriate use
of historical data (Swensen, 2009). The use of mean-variance optimization software
requires careful assessment of the estimates going into the analysis and judgment about
the ability of the portfolio to achieve the institution’s goals (Swensen, 2009).
Operationalizing Portfolio Theory can be challenging due to errors in estimating expected
returns, variances and correlations; it can also be very rewarding depending upon the
quality of the estimates. Simpler methods of diversifying portfolios by equal-averaging
across multiple asset classes have been demonstrated to provide significant benefits over
under-diversified portfolios (Gibson, 2008; DeMiguel, Garlappi, & Uppal, 2007).

Although sophisticated quadratic programming can be used in Markowitz
portfolio analysis (Francis, 2010), Gibson (2004) states that the key component of
Portfolio Theory is that of combining assets with dissimilar patterns of returns: “All
other things being equal, the more dissimilarity there is among the asset classes within a
portfolio, the stronger the diversification effect, providing investors with not only less
volatility, but also greater returns.” Thus, we posit:

**Hypothesis 6. The committee’s use of Portfolio Theory as a decision-making
framework has a positive effect on portfolio diversification.**

**Diversification of Portfolio**

Ample evidence of the benefits of diversification can be found in investment
textbooks, financial theory surveys and financial studies (Elton et al., 2010; Rubenstein,
2006). The popular definition of diversification is expressed as “not putting all your eggs
in one basket” and the mechanism for the benefits of diversification is that of combining assets with “less-than-perfect positive correlation” of returns (Francis, 2010). Industry studies have established positive correlations between portfolio size, diversification and performance (NACUBO, 2002-2008), but, to the best of our knowledge, researchers have not empirically tested the relationship between diversification and risk-adjusted performance among endowments of similar size. We posit:

_Hypothesis 7. Portfolio diversification (relative to peers of similar size) has a positive effect on risk-adjusted performance (relative to peers of similar size)._ 

**Comparison of Top and Bottom Performers**

Existing research demonstrating that larger endowments typically outperform smaller endowments adds little to our understanding of the wide divergence of performance among endowments of _similar_ size. As shown in Table 2, top-half performers for each size category in our sample had higher returns than the average performance of the next largest size category; similarly, the bottom-half performers in each size category had lower returns than the average performance of the next smallest size category. In aggregate, the top-half performers from each size category in our sample produced 5-year annualized returns of 4.0%, compared to only 1.3% for the bottom half performers from each category.
TABLE 2

<table>
<thead>
<tr>
<th>Category</th>
<th>NACUBO-Commonfund Study (n=650)*</th>
<th>Current Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 6 ($&gt;1 bil)</td>
<td>5.1%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Category 5 ($500 mil - $1 bil)</td>
<td>3.5%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Category 4 ($100 mil - $500 mil)</td>
<td>2.6%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Category 3 ($50 mil - $100 mil)</td>
<td>2.7%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Category 2 ($25 mil - $50 mil)</td>
<td>2.1%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Category 1 (&lt;$25 mil)</td>
<td>2.1%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Overall Average</td>
<td>2.7%</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

*In 2009 NACUBO-Commonfund study, 650 colleges/universities provided 5-year annualized returns.

RESEARCH METHODS

Sample

Our sample was drawn from 650 colleges and universities that have participated regularly in industry surveys about endowment investment practices and for which a minimum of five-year (2004-2009) performance data were available. A total of 191 colleges/universities responded to the survey for a response rate of 29%. That number was reduced to 179, or 27.5%, after eliminating nine cases due to incomplete surveys and three outliers. Sample size of 179 is considered adequate as it comfortably exceeds the minimum recommendation of five observations relative to the number of independent variables (Hair, Black, Babin, & Anderson, 2010).

Characteristics of respondents, shown in Table 3, revealed that all but four respondents were finance, foundation, or investment officers; two were outsourced Chief Investment Officers and two were investment committee members. On average,
respondents have served 11 years in an endowment-related role with the college/university. Respondents were from both public (39%) and private (61%) institutions and the size of endowments spanned all of the categories in the annual NACUBO-Commonfund study, from less than $25 million to greater than $1 billion. The average endowment size of survey participants as of fiscal year-end 2009 was $332 million, compared to $306 million in the 2009 NACUBO-Commonfund study. Not surprisingly, larger endowments are correlated (0.463***) with larger staffs of investment professionals.

### TABLE 3
Demographic Profiles of Respondents & Their Organizations

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number of Respondents</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respondent's Role with College/University</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial officer involved with the endowment</td>
<td>175</td>
<td>96%</td>
</tr>
<tr>
<td>Outsourced Chief Investment Officer</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Investment Committee Member</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Respondent # of Yrs in Endowment Role with the College/Univ</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than or equal to 2.5 years</td>
<td>22</td>
<td>12%</td>
</tr>
<tr>
<td>3 to 5 years</td>
<td>33</td>
<td>18%</td>
</tr>
<tr>
<td>6 to 9 years</td>
<td>30</td>
<td>17%</td>
</tr>
<tr>
<td>10 to 14 years</td>
<td>34</td>
<td>19%</td>
</tr>
<tr>
<td>15 to 19 years</td>
<td>35</td>
<td>20%</td>
</tr>
<tr>
<td>Greater than 20 years</td>
<td>23</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Endowment Size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 6: Greater than $1 billion</td>
<td>16</td>
<td>9%</td>
</tr>
<tr>
<td>Category 5: $500 million to $1 billion</td>
<td>20</td>
<td>11%</td>
</tr>
<tr>
<td>Category 4: $100 million to $500 million</td>
<td>56</td>
<td>31%</td>
</tr>
<tr>
<td>Category 3: $50 million to $100 million</td>
<td>30</td>
<td>17%</td>
</tr>
<tr>
<td>Category 2: $25 million to $50 million</td>
<td>25</td>
<td>14%</td>
</tr>
<tr>
<td>Category 1: Less than $25 million</td>
<td>32</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Institutional Funding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public (State Funded)</td>
<td>69</td>
<td>39%</td>
</tr>
<tr>
<td>Private</td>
<td>110</td>
<td>61%</td>
</tr>
<tr>
<td><strong>Number of Voting Members on Investment Committee</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than or equal to 3</td>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td>4-6</td>
<td>64</td>
<td>36%</td>
</tr>
<tr>
<td>7-9</td>
<td>84</td>
<td>47%</td>
</tr>
<tr>
<td>10-13</td>
<td>22</td>
<td>12%</td>
</tr>
<tr>
<td>14-18</td>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td>Greater than or equal to 19</td>
<td>1</td>
<td>1%</td>
</tr>
</tbody>
</table>
The investment committees in our sample have played important roles in key decisions concerning the management of the portfolio: 68% of respondents indicated that the committee made final decisions about hiring/firing managers and 67% said the committee made the final decision about hiring/firing consultants. Sixty-two percent of respondents indicated that the investment committee made the final decisions regarding policy asset allocations over the five-year measurement period, followed by the board of trustees/foundation, 34%. In response to the question, “Which body had the greatest impact on performance over the 2004-2009 period,” responses were distributed more widely: investment committee, 41%; consultant, 25%; staff (such as Chief Investment Officer or Chief Financial Officer), 16%; outsourced CIO or Investment Management Firm, 13%; board of trustees/foundation, 3%; and other, 2%.

To determine if the sample was representative of all 650 colleges with five-year performance data in the 2009 NACUBO-Commonfund survey we conducted an independent samples t-test of the means of the five-year annualized returns. No significant difference was observed between the means (t=0.44; df=826; p>.05). The

<table>
<thead>
<tr>
<th>Number of Meetings/Year of Investment Committee over 5-yr period</th>
<th>Less than or equal to 3</th>
<th>3-4</th>
<th>5-8</th>
<th>9-12</th>
<th>Greater than or equal to 13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>99</td>
<td>53</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>3.5%</td>
<td>55.6%</td>
<td>29.8%</td>
<td>7.6%</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># of Finance/Investment Staff with Significant Investment Experience</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4-7</th>
<th>8-12</th>
<th>13-20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27</td>
<td>57</td>
<td>43</td>
<td>22</td>
<td>22</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>32%</td>
<td>24%</td>
<td>12%</td>
<td>12%</td>
<td>4%</td>
<td>.5%</td>
</tr>
</tbody>
</table>
mean return from the NACUBO-Commonfund study was 2.7%, s=2.8%, while the mean of this sample was 2.6%; s=2.1%.

**Data Collection and Screening**

We assessed all measures for content validity using expert opinions of 12 asset management professionals. For internal validity, we used a pretest to assess the nature of the relationships among the constructs and modified problematic items as necessary. This strategy helped ensure that the measurement scales possessed adequate content validity, while allowing us to test for their psychometric properties (i.e., scale reliability and construct validity).

Empirical data to test the hypothesized relationships were obtained by using an electronic survey. Emails soliciting participation were sent to 650 colleges and universities, all of which had participated in the 2009 NACUBO-Commonfund Endowment Survey and/or in previous annual surveys sponsored solely by NACUBO and for which five-year performance data through mid-2009 were available. The list of institutions that received the request to complete the survey, the values of their endowment assets and other data are available on NACUBO’s website, (http://www.nacubo.org/Research/NACUBO_Endowment_Study/Public_NCSE_Tables_.html). Emails were addressed to financial officers requesting survey participation by a “key informant:” someone who has regularly attended committee meetings for at least several years and is very knowledgeable about the committee’s responsibilities and decision-making practices, as well as the investment experience of committee members. The solicitation email suggested that either the university financial officer most involved
with the endowment or the investment committee chair would be an ideal respondent. Three follow-up emails were sent in intervals of approximately 12 days during September and October, 2010.

After eliminating incomplete surveys and outliers, missing data on remaining cases were less than 1% and were replaced with median values for the variable. Although the data were slightly skewed, we did not detect serious violations of normality assumptions. Correlations between factors were all less than 0.60 and all variance inflation factors were below 4.0, indicating a lack of problems with multicollinearity. Homogeneity of variance was tested using Levene’s test. As all IVs and mediator were significant, we cannot reject the null hypothesis that the variance of the groups is equal.

**Measurement**

The questionnaire consisted of 21 items used in scales for the constructs, provided in Appendix A. In addition, respondents were asked to provide their endowment’s five-year annualized total return, using the same number they provided in the 2009 NACUBO-Commonfund study. Survey participants were instructed to base their responses over the period covering mid-2004 to mid-2009. That timeframe was chosen since: 1) it contained different market environments with periods of both positive and negative endowment performance; 2) it covered a span in which the majority of survey recipients were expected to have been involved with the endowment; 3) it was sufficiently recent for participants’ recollection; and 4) it permitted a sufficient number of respondents with five-year performance data in order to conduct meaningful analysis.
Independent Variables

The scale items for the three independent variables (diverse expertise, learning commitment and open-mindedness) employed a 7-point Likert scale ranging from Very Strongly Disagree to Very Strongly Agree. Both learning commitment and open-mindedness were adapted from existing scales (Sinkula et al., 1997; Calantone et al., 2002). Among the learning commitment items were: “The committee believed learning is a key commodity for long-term success” and “The committee was committed to learning about successful endowment practices.” Open-mindedness items included: “Committee members frequently questioned their biases about investing” and “The committee was not afraid to reflect critically on investment-related assumptions it made.” Items for diverse committee expertise were informed by extensive interviews from an earlier qualitative study (Lord, 2010), theory (Forbes & Milliken, 1999), and pre-testing with investment professionals. Committee expertise items sought to identify whether members had expertise across a broad variety of investments including traditional and alternative asset classes, as well as public and private.

Portfolio Theory

Portfolio Theory is hypothesized as an intermediary variable serving as a decision-making process for portfolio allocations. The development of the Portfolio Theory measure was informed by theory (Markowitz, 1952, 1959) and by pre-testing with 12 investment professionals. Items inquired about members’ consideration of investments’ expected returns, variance of returns and correlations of returns when making portfolio decisions. Additional questions included variations of those items, such as: “The
committee considered the risk-return characteristics of the overall portfolio when making changes in its composition” and “The committee carefully considered the downside risks of existing and potential investments.”

**Diversification of Portfolio**

Since portfolio diversification and size of portfolio have been linked in previous studies (NACUBO, 2002-2008), our measure of portfolio diversification controls for size by asking for participants’ perception of their endowment’s degree of diversification relative to the average diversification of peers in their size category in annual industry studies. Size categories in the NACUBO-Commonfund study are as follows: 1) <$25 mil; 2) $25 mil to $50 mil; 3) $50 mil to $100 mil; 4) $100 mil to $500 mil; 5) $500 mil to $1 bil; and 6) >$1 bil.

Supporting evidence of participants’ awareness of other endowments’ degree of diversification is based on an 86% affirmative answer to the following survey question: “Has the committee typically compared your institution with others in the NACUBO and/or Commonfund study over the past several years?” Of the 179 participants in this study, 154 responded “yes,” 19 responded “no,” and six did not respond.

Three items were used to measure portfolio diversification relative to size peers over the recent 10-year, 5-year, and 1-year periods; response choices ranged from 1-significantly less diversified to 5-significantly more diversified. While we are primarily interested in the 5-year period, we included both a longer and shorter period for a fuller perspective; industry surveys have documented the steady, incremental march toward greater portfolio diversification, both on a total industry level and on the category size.
level (NACUBO, 2002-2008). It is thus logical to assume that participants’ perceptions of their endowments’ diversification relative to their size peers would be largely consistent over the time periods.

**Performance**

For performance measurement, our survey requested annualized total returns of endowments over 1, 3, 5, and 10-year periods ended fiscal 2009; the 5-year data used in this study were crossed-checked with data in the 2009 NACUBO-Commonfund Endowment Survey. In order to obtain risk-adjusted performance we divided the five-year annualized return of each endowment by the standard deviation of the annual returns over the five years. Since endowment size has already been linked to performance in industry studies (NACUBO 1990-2008), we chose to measure risk-adjusted performance of each university *relative* to the risk-adjusted average performance of peers in their own size category. Therefore, both portfolio diversification and risk-adjusted performance are relative measures.

**Control Variables**

We control for the number of endowment staff with professional investment expertise as well as absolute endowment size since these variables have been linked previously to investment performance (NACUBO, 2002-2008).

**Exploratory Analysis**

An Exploratory Factor Analysis was conducted simultaneously with all items for the latent factors using Principal Axis Factoring with Promax rotation. The Kaiser-Meyer-Olkin measure of .904 indicated sampling adequacy for factor analysis. Analysis of
initial communalities revealed that all items exceeded the threshold of 0.50. An unconstrained five-factor model emerged from the extraction process. All five factors had eigenvalues greater than 1.0 and explained 81% of total variance. The pattern matrix, as shown in Appendix B, revealed that all items loaded highly on their intended factors with minimal cross-loading.

**Confirmatory Factor Analysis**

We carried out Confirmatory Factor Analysis (CFA) to validate the initial factors’ structure and to assess model fit, which was deemed acceptable (cmin/df of 1.427, GFI of .892, CFI of .977, PCFI of .819 and RMSEA of .049 with PCLOSE of .537). Three pairs of items were covaried, each within its hypothesized construct, contributing positively to model fit. A chi-square difference test confirmed measurement invariance of two groups (top performers and bottom performers). Descriptive statistics and the CFA diagram are provided in Appendices C and D, respectively. As seen in Table 4, loadings ranged from .66 to .94 and all were statistically significant at p < 0.001.
TABLE 4
CFA Measurement Model Results

<table>
<thead>
<tr>
<th>Code</th>
<th>Construct</th>
<th>Est</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXP1</td>
<td>Diverse Expertise</td>
<td>0.864</td>
<td>0.065</td>
<td>13.356</td>
<td>***</td>
</tr>
<tr>
<td>EXP2</td>
<td>Diverse Expertise</td>
<td>0.892</td>
<td>0.063</td>
<td>14.161</td>
<td>***</td>
</tr>
<tr>
<td>EXP4</td>
<td>Diverse Expertise</td>
<td>0.907</td>
<td>0.063</td>
<td>14.480</td>
<td>***</td>
</tr>
<tr>
<td>ZQ1_1</td>
<td>Learning Commitment</td>
<td>0.844</td>
<td>0.060</td>
<td>14.095</td>
<td>***</td>
</tr>
<tr>
<td>ZQ1_2</td>
<td>Learning Commitment</td>
<td>0.948</td>
<td>0.056</td>
<td>17.073</td>
<td>***</td>
</tr>
<tr>
<td>ZQ1_3</td>
<td>Learning Commitment</td>
<td>0.912</td>
<td>0.058</td>
<td>15.748</td>
<td>***</td>
</tr>
<tr>
<td>ZQ1_4</td>
<td>Learning Commitment</td>
<td>0.888</td>
<td>0.058</td>
<td>15.381</td>
<td>***</td>
</tr>
<tr>
<td>ZQ1_5</td>
<td>Learning Commitment</td>
<td>0.946</td>
<td>0.055</td>
<td>17.053</td>
<td>***</td>
</tr>
<tr>
<td>ZQ3_1</td>
<td>Open-mindedness</td>
<td>0.662</td>
<td>0.068</td>
<td>9.735</td>
<td>***</td>
</tr>
<tr>
<td>ZQ3_2</td>
<td>Open-mindedness</td>
<td>0.827</td>
<td>0.063</td>
<td>13.176</td>
<td>***</td>
</tr>
<tr>
<td>ZQ3_3</td>
<td>Open-mindedness</td>
<td>0.866</td>
<td>0.061</td>
<td>14.306</td>
<td>***</td>
</tr>
<tr>
<td>ZQ3_4</td>
<td>Open-mindedness</td>
<td>0.742</td>
<td>0.065</td>
<td>11.451</td>
<td>***</td>
</tr>
<tr>
<td>ZQ8_1</td>
<td>Portfolio Theory</td>
<td>0.759</td>
<td>0.064</td>
<td>11.777</td>
<td>***</td>
</tr>
<tr>
<td>ZQ8_2</td>
<td>Portfolio Theory</td>
<td>0.783</td>
<td>0.064</td>
<td>12.153</td>
<td>***</td>
</tr>
<tr>
<td>ZQ8_3</td>
<td>Portfolio Theory</td>
<td>0.929</td>
<td>0.058</td>
<td>15.937</td>
<td>***</td>
</tr>
<tr>
<td>ZQ8_4</td>
<td>Portfolio Theory</td>
<td>0.852</td>
<td>0.061</td>
<td>13.925</td>
<td>***</td>
</tr>
<tr>
<td>ZQ8_5</td>
<td>Portfolio Theory</td>
<td>0.832</td>
<td>0.062</td>
<td>13.387</td>
<td>***</td>
</tr>
<tr>
<td>ZQ8_6</td>
<td>Portfolio Theory</td>
<td>0.754</td>
<td>0.065</td>
<td>11.667</td>
<td>***</td>
</tr>
<tr>
<td>ZQ6_1</td>
<td>Diversification of Portfolio</td>
<td>0.829</td>
<td>0.063</td>
<td>13.141</td>
<td>***</td>
</tr>
<tr>
<td>ZQ6_2</td>
<td>Diversification of Portfolio</td>
<td>0.987</td>
<td>0.057</td>
<td>17.215</td>
<td>***</td>
</tr>
<tr>
<td>ZQ6_3</td>
<td>Diversification of Portfolio</td>
<td>0.791</td>
<td>0.064</td>
<td>12.320</td>
<td>***</td>
</tr>
</tbody>
</table>

Significance: ***p<0.001

Common Method Variance

To begin, we tested for common method bias using a post hoc procedure suggested by Podsakoff and Organ (1986). Using the principal components factor analysis, evidence of common method bias exists when a single factor emerges from the analysis, or one general factor accounts for the majority of the covariance in the interdependent and dependent variables. Those conditions do not exist in our factor analysis. A second test for CMB involved the addition of a marker variable (Lindell & Whitney, 2001), which reduced common method bias to 7.3%.

Reliability and Validity Analysis

To assess the measurement model’s reliability, discriminate and convergent validity, we used the composite reliability coefficient (CR), average variance extracted
(AVE) and the shared variance (Maximum Shared Variance, MSV, and Average Shared Variance, ASV). Table 5 indicates that the model met the threshold for item reliability (CR > .70) as well as those for convergent and discriminant validity, both before and after controlling for common method variance (CMV). To estimate the common method variance we used the correlation between the marker variable and the other factors to recompute the reliability and validity measures shown in Table 5. All of the measurement model’s constructs retained their reliability, convergent and discriminate validity even after controlling for common method variance. Internal consistency was confirmed with Cronbach’s alpha coefficients all well above .7. The measures support the reliability as well as the convergent and discriminant validity of the constructs.

### TABLE 5
Reliability and Validity Tests for Constructs

<table>
<thead>
<tr>
<th>Factor</th>
<th>Chronbach’s Alpha</th>
<th>Before Controlling for CMV</th>
<th>After Controlling for CMV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diverse Expertise</td>
<td>EXP</td>
<td>C.R.</td>
<td>AVE</td>
</tr>
<tr>
<td>Learning Commitment</td>
<td>LCom</td>
<td>.960</td>
<td>.96</td>
</tr>
<tr>
<td>Open-Mindedness</td>
<td>OM</td>
<td>.866</td>
<td>.87</td>
</tr>
<tr>
<td>Use of Portfolio Theory</td>
<td>PT</td>
<td>.928</td>
<td>.92</td>
</tr>
<tr>
<td>Diversification of Portfolio</td>
<td>DPort</td>
<td>.895</td>
<td>.90</td>
</tr>
</tbody>
</table>

Convergent Validity Thresholds:  
CR > .7
CR > AVE
AVE > .5

Discriminant Validity Thresholds:  
MSV < AVE
ASV < AVE

Hypotheses Testing

Hypotheses were tested using covariance-based structural equation modeling (SEM). Results for the full sample are shown in Figure 2 (before trimming insignificant paths) and also in Table 6, both before and after trimming insignificant paths. The
The trimmed model has excellent fit with CMIN/DF of 1.11, CFI of .996 and RMSEA of .025.

**FIGURE 2**

*Results of Hypothesized Model (Standardized Estimates)*

![Diagram showing relationships between variables: EXP, LCom, PT, DPort, PERF.]

**TABLE 6**

*Results: Hypotheses 1-7*

<table>
<thead>
<tr>
<th>Structural Paths</th>
<th>Estimates (Unstandardized)</th>
<th>Critical Ratio</th>
<th>p-value</th>
<th>Hypothesis Supported/Not Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before Trimming Insignificant Paths</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>3.273</td>
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Results of the mediation tests indicate that PT does not mediate the effect of EXP on DPORT since the path from EXP to PT is insignificant. EXP does have a direct effect on DPORT. LCOM and OM both have an indirect effect on DPORT via PT. Lastly, PT has an indirect effect on PERF via DPORT.

The control variable for the number of full-time professional investment staff does have a significant effect on our relative performance dependent variable. However, our second control variable-- absolute endowment size-- does not have a significant effect on the performance of endowments relative to their size category.

DISCUSSION

Open-mindedness is shown to be a significant antecedent to Portfolio Theory considerations; this suggests that campus administrators, committee chairs and others involved in portfolio decision-making should encourage open discussions that allow for questioning of team member biases and assumptions. In this study, open-mindedness plays an important role in influencing the process (Portfolio Theory considerations) that leads to greater portfolio diversification.

Similarly, learning commitment has an indirect effect on portfolio diversification via Portfolio Theory. Committees with stronger learning commitment are more likely to consider Portfolio Theory principles, leading to greater portfolio diversification.

Committees with greater expertise across a variety of asset classes led directly to greater portfolio diversification. Greater portfolio diversification, in turn, led to higher risk-adjusted returns.
RESEARCH CONTRIBUTIONS

This study adds to existing research linking portfolio diversification to risk-adjusted performance, and makes new contributions to research in several ways. First, we develop a scale for measuring the committee’s use of Modern Portfolio Theory principles; it captures the three key components of estimating investment returns, variance and correlations of return. I had the honor of meeting with Professor Harry Markowitz, founder of the theory, in March 2011 and was pleased that he found the construct items suitable. While the Portfolio Theory framework could be expected to lead to more diversified portfolios due to its emphasis on uncorrelated assets, we have not seen it tested empirically prior to this study. In addition, this is the first study to apply the group norms of learning commitment and open-mindedness in the university endowment setting. Although the domain we studied is quite specific, the use of those group norms may have broader applicability in other group decision-making settings.

PRACTICAL CONTRIBUTIONS

This study contributes to literature about institutional portfolio diversification and performance by examining characteristics and practices of the investment committee—the group that makes the all-important asset allocation decisions for most university endowments. The hypothesized beneficial effects from having a committee with diverse expertise, a commitment to learning and open-mindedness were supported and can be promoted on university campuses. In addition, the Portfolio Theory framework was shown to be an effective decision-making process for adopting more diversified portfolios.
Although industry studies have documented that investment staff size is correlated with endowment size and that endowment size is correlated with performance, (NACUBO, 1990-2008), our finding that staff size has a significant positive effect on relative performance within size categories is noteworthy. While examined as a control variable, the result has important implications for endowment fiduciaries in their considerations of staffing resources. The fact that size of professional investment staff had a significant effect on relative performance, but not on relative portfolio diversification, suggests that larger staffs provide other functions—such as analysis of money managers, investment strategies, and specific securities—that contribute to performance.

**LIMITATIONS**

Despite its contributions, our study has some notable limitations providing opportunities for future research. First, our measures of committee characteristics and practices were based on key informant assessments that may be biased. Second, numerous other factors that contribute to performance-- such as criteria and processes for selecting consultants and money managers, and the selection of individual securities and timing of investments—were not examined. And performance itself is not the only goal that investment committees pursue; other factors such as steady income and portfolio liquidity were not addressed.

Our measure of relative portfolio diversification may be questioned due to its lack of objectivity; however, we would argue that any measure of that construct includes some degree of subjectivity-- including the types and number of asset classes selected as the
universe. Portfolio diversification may also be questioned as a worthy outcome since it may be adopted by unsophisticated investors who invest in asset classes they do not understand.

We believe our findings are generalizable across U.S. university endowments; a topic for future research would be assessing their applicability to other institutional investment pools where committees make asset allocation decisions.
APPENDIX A
Constructs, Definitions and Items

Diverse Expertise (EXP): Committee members’ expertise across a broad variety of asset classes and investments

- Our committee over the 5-year period always included expertise across a broad variety of asset classes. (EXP1)
- Our committee always included expert knowledge in both traditional and alternative asset classes. (EXP2)
- Our committee always included experts in both public and private investments. (EXP4)

Learning Commitment (LCom): The shared belief that learning is essential for success

- Investment committee members were in agreement that their ability to learn about endowment management is essential to our success. (LC1)
- The basic values of the committee included learning as key to improvement. (LC2)
- The committee viewed learning as an investment, not an expense. (LC3)
- The committee was committed to learning about successful endowment practices. (LC4)
- The committee believed learning is a key commodity for long-term success. (LC5)

Open-Mindedness (OM): The committee’s critical assessment of its assumptions, biases and decisions

- Committee members frequently questioned their biases about investing. (OM 1)
- Committee members routinely judged the quality of the decisions they made. (OM2)
- The committee was not afraid to reflect critically on investment-related assumptions it made. (OM3)
- Committee members realized that the way we perceive the markets must be continually questioned. (OM4)

Use of Portfolio Theory (PT): The Committee’s consideration of principles of Portfolio Theory in making portfolio decisions

- When making portfolio decisions, the committee routinely considered expected returns of investments. (PT1)
- The committee routinely reassessed expected returns of investments based on changing market conditions. (PT2)
- The committee routinely considered the correlation of returns of existing and potential portfolio holdings. (PT3)
- As part of the portfolio decision-making process, the committee analyzed investments’ historical variation of returns. (PT4)
- The committee considered the risk-return characteristics of the overall portfolio when making changes in its composition. (PT5)
- The committee carefully considered the downside risks of existing and potential investments. (PT6)

Diversification of Portfolio (DPort): The degree of endowments’ portfolio diversification relative to their size category in annual industry surveys

- Our endowment performance over the SINGLE FISCAL YEAR 2009 relative to our size category was... (DPort1)
- Our endowment’s diversification over the FIVE YEARS ended 2009 compared to our size category was.(DPort 2)
- Our endowment’s diversification over the DECADE ended fiscal 2009 compared to our size category was...(DPort3)

NOTE: Items in EXP, LCom, OM and PT referred to the 2004-2009 period and were measured using a 7-point scale (1=very strongly disagree, 7= very strongly agree). Items for DPort were measured using a 5-point scale (1=significantly less diversified, 5=significantly more diversified).
APPENDIX B
Pattern Matrix, MSAs and Communalities of Extracted Factors

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<th>Diverse Expertise</th>
<th>Open Mindedness</th>
<th>Portfolio Diversification</th>
<th>MSAs</th>
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Extraction Method: Principal Axis Factoring.
Rotation Method: Promax with Kaiser Normalization.
Rotation converged in 5 iterations.
MSA is Measure of Sampling Adequacy.
### APPENDIX C
Descriptive Statistics

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Note: All measures used a 7-point Likert scale except DPort, which used a 5-point scale.
APPENDIX D
Confirmatory Factor Analysis Model
## APPENDIX E

**Correlation of Measures for Constructs**

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**Note:** All correlations significant at p< 0.001 except where noted otherwise. ns = nonsignificant
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