A U.S. FOR-PROFIT EDUCATION INDUSTRY INDEX'S PERFORMANCE DURING A RECESSION

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ABSTRACT

The purpose of this paper is to evaluate the stock performance of the publicly-traded for-profit education and training services industry in the U.S. during the recessionary years of 2008 through 2010. This study contributes to the work in human capital theory by testing the education industry's performance during recessionary years.

A price index, weighted by the education firms' market capitalization, and the Russell 3000 Index as a proxy for the market served to assess the daily returns of the education industry relative to the market. No evidence was found indicating that the education portfolio performed better than the market, which could be an indicator of other issues affecting the industry. **JEL Classification:** G11, I21, I23, I26

INTRODUCTION

Human capital theory states that individuals will pursue educational opportunities to increase their economic options (Griffith, 2011a; Tan, 2014; Vandenberghe, 1999). According to this theory, societal changes (such as job loss, household, etc.) may motivate people to pursue education to acquire new skills and knowledge that can enhance their economic positions within that society. The changes in the enrollment levels within the education and training services industry (AKA for-profit education industry) should be explained, in part, by this theory (Fincher & Katsinas, 2017).

A positive correlation between unemployment rates and higher education enrollment levels, as would be expected according to human capital theory, was documented using data from the National Educational Longitudinal Study (NELS) and the Current Population Survey (CPS) of March 1992 from the United States (U.S.) Census Bureau (Perna, 2000). Perna established that each 1 percent increase in the unemployment rate led to a 2.6 percent increase in enrollment levels across the higher education industry (including for-profits). Accordingly, the enrollment levels of the for-profit education industry should increase as the U.S. unemployment rate increases.

When institutional enrollment levels rise, the profits of the firms should also increase. The opposite should also be true when enrollment levels decline. Under the

assumption of market efficiency, these changes in enrollment levels should ultimately be reflected in the stock prices of the industry's firms (Ball & Brown, 1968). Most studies of capital markets and recessionary periods include the for-profit education industry as if it experiences similar pressures as other firms do during a recession. However, evidence of rising enrollment levels during times of rising unemployment suggests the for-profit education industry may be a countercyclical industry (see Hayes, 2010; Heller, 1999; Perna, 2000). This suggests that the industry should be examined independently of the overall market since it should experience increasing revenues when unemployment levels are rising and many other industries within the market are declining during the same periods.

From 1994 through 2008, the U.S. seasonally adjusted unemployment rates were relatively stable and within one standard deviation of 5.1 percent (Division of Labor Force Statistics, 2010a, 2010b). Since 2000, the unemployment rates began to increase (Guha & Baribeau, 2009). During 2008 through 2010, the national unemployment rate rose from 5.8 percent to 9.6 percent (Aguiar, Hurst, & Karabarbounis, 2013) with its highest levels, since the early 1980s, occurring during 2009 (Guha & Baribeau, 2009).

Since the United States experienced a significant economic recession during the 2008, 2009, and 2010 calendar years (Aguiar et al., 2013), human capital theory indicates that the for-profit education industry's stock prices should outperform the overall market during recessionary years. The purpose of this paper is to evaluate the stock performance of the publicly traded for-profit education and training services industry in the U.S. during the calendar years of 2008 through 2010. This study is relevant to the decisions that investors make during times of rising unemployment.

Two assumptions are required to accomplish this study: 1) for-profit education institutions have the capacity to meet the demands of the market and 2) these institutions operate on a profit-per-student basis. This study is limited to the Google Finance, Compustat, CRSP, and Yahoo! Finance databases. It does not include any not-for-profit educational institutions.

Table 1 contains definitions of terms utilized throughout this paper. The duration of this paper contains a review of the literature, a description of the methodology utilized, a discussion of the results, and the conclusion with some suggestions for areas of future research.

LITERATURE REVIEW

Human Capital Theory

The origins of human capital theory can be traced back to Adam Smith, John Dewey, Theodore Schulz, Gary Becker, and several others (Becker, 1993; Hewlett, 2002; Loomis & Rodriguez, 2009; Schumann, 2004; Stanfield, 2009; Wilson & Moore, 1973). It posits that individuals would seek education as a means to acquire new skills and knowledge and that such acquisition would enhance their economic options (Griffith, 2011a; Tan, 2014; Vandenberghe, 1999). Human capital theory does not explain every reason why one pursues education (Marginson, 2017; Merriam, Caffarella, & Baumgartner, 2007). Some educational pursuits are motivated "by personal or familial values and beliefs, regulatory requirements, and citizenship

(Bauman et al., 2004; Merriam et al., 2007) or a desire to learn (Wolfgang & Dowling, 1981)" (Griffith, 2012, p. 91).

The exploration of "the relationship between education and economic growth, efficiency, and equity…" (Hewlett, 2002, p. 23) has been the dominant research area under this theory. While many researchers in the human capital theory areas have focused on the macro-variables, Hewlett advocates that research should also include the micro-variables such as "motivation, memory, schema, elaboration, and contextualism" (p. 38) He argues that a focus on macro-variables may lead to inaccurate conclusions because a macro-variable is often a product of its prerequisite factors (such as a specific educational attainment level) and cannot be distinguished from the underlying factors. While this study focuses on a single macro-variable (the industry's collective stock performance in the form of an index), it is important to note that several micro-variables influence this macro-variable.

In South Africa, van der Merwe (2010) found that higher education students view education as an investment and expect a future return on their investments. He tested two human capital theory related models and confirmed that higher education demand involves factors of social and familial influences, economic motivations, expected future values of higher education pursuits and attitudes towards higher education.

Education and Training Services Industry

Loomis and Rodriguez (2009) present an argument that the world's education system is moving towards a more standardized output with the practitioner in mind. The standardized output of a global education system implies that the skillsets acquired will be portable and not limited to one country or region. Much of this has been attributed to a tendency for education institutions to focus on matters that have less of a cultural or geographical emphasis to a particular host area. These institutions have few differing qualitative characteristics relative to other institutions in their peer groups.

Evidence supporting the human capital theory perspective that the quality of one's education is related to one's earnings power can be found in the work of Sandy and Duncan (1996). They examined the role that private and public education institutions (grades 1-12) have with the earnings power of their graduates. In this study, the authors controlled for variables such as "school quality, family background, educational achievement, occupation and motivation" (p. 311). They concluded that students who attended a private school have a positive earnings advantage over those students who attended a public school.

Specific to higher education institutions, Abelman and Dalessandro (2008) explored the role of institutional vision within the education and training services industry in the United States. They segmented the industry into eight categories: community colleges, public and private baccalaureate granting, public and private master's granting, public and private doctorate granting, and for-profit institutions. They concluded that for-profit institutions are more aggressive than the other institutional categories at promoting their abilities to prepare students for a career. In addition, the authors concluded that for-profit institutions are more motivated by their profit-producing activities than their institutional visions.

Under the assumptions that education firms operate on a profit-per-student basis

and capacity is not limited at the institutional level, the earnings announcements of 24 publicly-traded firms in the U.S. education and training services industry were evaluated for evidence of timing effects and possible abnormal returns during the 2008, 2009, and 2010 calendar years (Griffith, 2017). Support for human capital theory was found via the significant positive abnormal results that occurred in response to positive earnings surprises. No evidence of opportunistic timing practices associated with earnings announcement releases was found.

Similar to the work of Sandy and Duncan (1996), Lauer (2002) examined the relationship between economic incentives and enrollment levels in German higher education institutions. She determined that variables influencing higher education enrollment levels include parental educational attainment, parental occupational decisions, familial attitudes towards education, net household income, expected wage premium related to education decisions, and unemployment risk. With respect to the unemployment risk variable, she found a future reduction of one's unemployment risk resulting from additional education is not as important as the assessment of one's current unemployment risk when making the decision to pursue a higher education.

Along a thought process analogous to Lauer (2002), Vasigh and Hamzaee (2004) explored the effect that increases in tuition rates have on enrollment levels in a private university setting. Both current and prospective students at the undergraduate and graduate levels were surveyed about their understanding of tuition rates of three institutions in the United States. The respondents perceived the tuition rates to be greater than the actual rates. The authors ascertained that changes in tuition rates have an inverse relationship with changes in enrollment levels such that a 1 percent increase in tuition translates to a 0.22 percent decrease in enrollment.

The education industry tends to experience higher enrollment levels when unemployment levels are high (Fincher & Katsinas, 2017; Perna, 2000). This statement supports the widely-accepted observation by researchers in the areas of education and unemployment that people pursue education primarily to improve their economic options (Courant, McPherson, & Resch, 2006; Loomis & Rodriguez, 2009; Tan, 2014; Vandenberghe, 1999).

Student enrollment levels within the education industry are expected to change as unemployment levels vary within the host economy (Fincher & Katsinas, 2017), resulting in periods of increasing profits during periods of rising unemployment levels and declining profits during periods of lower unemployment levels. It follows that the business cycle of the education industry would be different from the business cycles of most industries within the market (Fincher & Katsinas, 2017). Since stock prices are often assumed to be a function of the expected future profits of a firm, the stock prices of firms in the education industry should behave in a manner that is inconsistent with the overall market during recessionary periods. Evidence of this difference should be manifested in the industry's stock price performance because an increase in enrollment levels during periods of high unemployment should translate to higher profits within the industry. Thus, the corresponding hypothesis for researching this topic is:

During a recession, firms in the for-profit education industry experience returns greater than the market.

METHODOLOGY

To test this hypothesis, the data was retrieved from the Compustat, CRSP, Yahoo! Finance, and Google Finance databases and segregated into two groups: the for-profit education industry and the Russell 3000 Index. The Russell 3000 Index was selected because it represents 98 percent of the United States equity market that is open to public investing (Russell Investments, 2011). This index represents the performance of the majority of the equity markets within the United States. It is a price index weighted by the market capitalization of the firms in the index. It is recalculated on an annual basis at the end of June using the market capitalization at the end of immediately preceding May (Shankar & Miller, 2006). The data for testing this hypothesis was daily in frequency and spanned the calendar years of 2008-2010.

The hypothesis was tested as follows. The two portfolios were tested at an industry level. The first portfolio comprised the for-profit education firms and the second portfolio was the Russell 3000 Index. The cumulative returns of each portfolio using daily data were measured and compared. To facilitate the testing of this hypothesis, the portfolio related to the for-profit education industry was constructed on a market capitalization basis similar to the Russell 3000 Index. The education portfolio's market capitalization was determined as of the end of May for each period but was not implemented until the end of June. Thus, the first half of each calendar year was based on the market capitalization effective at the end of June from the prior year. The differences in means between the two portfolios were tested using the paired t-test, the Wilcoxon test, and bootstrap.

Data Collection

The firms in the education industry were identified through Compustat with the NAICS codes that began with 61 (Standard & Poor's, 2011a). Table 2 contains the codes that were utilized in this search. This effort produced 40 firms. This list was then compared to the firms listed as members of the education industry as presented by Yahoo! Finance. This resulted in identifying four additional firms as potential candidates for inclusion in this study.

A careful examination of the pool of 44 tentative firms resulted in the exclusion of 18 firms for the following reasons. One firm was excluded because it had recently shifted its focus from another industry into the education industry and that meant that its earnings and historical stock performance were not representative of its current classification as an education industry participant. Firms that were not listed on a major U.S. stock exchange were excluded because this study focused only on those firms listed on the NYSE, AMEX, or NASDAQ. Firms that traded as American Depository Receipts (ADRs) on a major U.S. stock exchange were removed from this study because the actual shares of the firm are not traded on a U.S. exchange and the underlying firm itself is not a U.S.-based firm, which indicates that the firm is not subject to the same operational stressors as those operating in the U.S. Firms that had recently become publicly traded and their trading period began after June 30, 2010 or that had terminated trading prior to June 30, 2008 were omitted from this study. All firms with missing data were eliminated from this study. This screening process

reduced the group of firms to 26.

Table 3 presents the firms that were included in the education portfolio. Of these firms, half offered both campus-based and online post-secondary educational services and account for 84.52 percent of the market capitalization at the end of 2010 and 89.78 percent of the average daily trading volume. Two firms provided only online post-secondary education, make up 6.25 percent of the total market capitalization at the end of 2010 and contribute only 3.17 percent of the average daily trading volume to the education portfolio. Five firms provided on-site training and online education services and six other firms provided other education related services. The latter eleven firms accounted for 9.24 percent of the total market capitalization at the end of 2010 and 7.04 percent of the average daily trading volume for this portfolio. Clearly, the firms that offer both a campus-based and online post-secondary education experience dominate the education portfolio's structure.

The daily price data for the firms in the education industry and the Russell 3000 Index was collected from Yahoo! Finance (Yahoo! Inc., 2011) and Google Finance (Google, 2011). The retrieved historical prices for the calendar years 2008 through 2010 were validated by the data in Compustat (Standard & Poor's, 2011c).

The quarterly market values and outstanding shares were retrieved from Compustat (Standard & Poor's, 2011a, 2011b). This data belonged to the calendar years 2007 through 2010.

RESULTS

To facilitate the testing of the hypothesis, two portfolios were constructed. One portfolio consisted of the 26 publicly-traded firms identified as belonging to the education industry (as described in Table 3). The other portfolio was the Russell 3000 Index. The daily returns for each portfolio were calculated. Since the Russell 3000 Index is a market-weighted index (Shankar & Miller, 2006), the education portfolio index was computed using the same market-weighted methodology. The descriptive statistics of the portfolio returns are summarized in Table 4 and a histogram of the daily returns is presented in Figure 1.

The education portfolio and the Russell 3000 Index experienced slightly more gains than losses during the 2008-2010 calendar years. The Russell 3000 Index had 408 sessions with daily gains out of 756 trading days in its sample, while the education portfolio had 390 such sessions. The education portfolio realized an average daily return of -0.02 percent with a standard deviation of 2.41 percent. The Russell 3000 Index realized an average daily return of -0.01 percent with a standard deviation of 1.94 percent. Both the education portfolio and the Russell 3000 Index have distributions, which exhibit departures from normality. The skewness of both distributions is slightly to the left with values of –.7309 and -.2254 respectively indicating that both the market and education industry had more positive than negative returns as expected for financial securities. Moreover, the kurtosis of 5.5040 for the education portfolio and 5.3109 for the Russell 3000 Index suggest higher probability of extreme return values than predicted by a normal distribution.

Figure 2 presents a common-size trend chart comparing the daily index values of both the education portfolio and the Russell 3000 Index. The education portfolio lost value beginning with January 2008 and did not fully recover until February 2009. It

then lost value again and did not recover the lost value until October 2009. It reached its maximum value in April 2010.

The Russell 3000 Index lost value from January 2008 until March 2009. In March 2009, it began to recover its lost value. Overall, from January 2008 to the end of December 2010, the Russell 3000 Index outperformed the education portfolio. From March 2009 to October 2009 and from November 2009 to April 2010, the education portfolio's performance was similar to that of the Russell 3000 Index. From April 2010 to July 2010, the education portfolio declined in value while the Russell 3000 Index increased in value.

In August 2010, a report by the U.S. Government Accountability Office (U.S. GAO) was released that accused many of the for-profit education institutions of engaging in fraudulent activities in the recruitment and retention processes of their students. Since that event, the industry's value declined more than 25 percent and failed to fully recover the value lost during the remainder of 2010. Until the April 2010 decline and subsequent decline associated with the release of the August 2010 report by the U.S. GAO, the education portfolio index suggests that these firms did a better job at retaining their market capitalization value than the Russell 3000 Index firms. This is attributed to maintaining enrollment levels at the education institutions during this recessionary period. With the release of the August 2010 report, frequent and common-themed complaints that had surrounded the for-profit education industry from its former students appear to have been confirmed by the U.S. GAO investigation and subsequent actions by the courts and regulators of this industry.

Evidence supporting human capital theory during a recessionary period should be found through the positive changes in earnings per share from one quarter to the next during the periods that people are trying to retool to find better economic options. The changes in earnings per share should ultimately be manifested in the price of the stock as well as an outlook for each firm within the education industry. Collectively, these would then be reflected in the education portfolio's value. If the portfolio's value rises while the market is falling, this trend would suggest a positive outlook for the education industry, which would suggest an increase in student enrollment or profit per student with stable enrollment. If its value falls while the market's value is rising, this should indicate a negative outlook for the education industry and suggest a decline in profit per student or in student enrollment.

The cross-correlations of the two portfolios were calculated using a range of -10 day to +10 day (including the event day 0) to explore the possibility that returns observed on a given event day may be associated with a lag effect. As illustrated by Figure 3, there is no real lag effect associated with the returns on a given event day. The returns associated with each event day are not significantly influenced by the returns from other days in the event windows.

Descriptions of the tests associated with comparing the daily returns of the education portfolio and the Russell 3000 Index follow. The differences of means between the two portfolios were tested using the paired t-test, the Wilcoxon test, and bootstrap and the results are presented in Table 5. The tests were performed using a NCSS statistical software package (Hintze, 2007).

Bootstrap is the most appropriate test as it does not have the normality or symmetrical assumptions as a requirement. "The assumptions of the [paired] t-test include a normal distribution, equal variances, dependent samples, and random selection of samples" (Griffith, 2017, p. 73); the normal distribution assumption

was not met. The Wilcoxon signed-rank test's assumptions involve a symmetrical distribution of the differences, non-discrete differences, mutual independence, the same median, and at least an interval scale; the assumption of mutual independence is not met.

Bootstrap provided a mean of -0.0086 and a standard error of 0.0787. The results of the bootstrap indicate that the differences are not statistically significant as zero is within the 95% confidence limits of -0.1619 and 0.1474 (lower and upper limits respectively). This leads to the conclusion that there is no statistically significant difference between the daily returns of the education portfolio and those of the Russell 3000 Index. Thus, the test results indicate that the first hypothesis is unsupported.

CONCLUSIONS AND AREAS FOR FUTURE RESEARCH

This study examined the stock price performance of the publicly-traded for-profit education industry during the calendar years 2008 through 2010 to test for evidence that periods of high unemployment led to better stock price performance of those firms, as suggested by human capital theory. It was hypothesized that a portfolio based on publicly-traded education stocks would experience returns greater than the Russell 3000 Index. A portfolio of 26 publicly-traded education firms was constructed using the methodology of the Russell 3000 Index. This portfolio serves as an index of the education industry. The testing of the daily returns from both indices spanning the calendar years of 2008, 2009, and 2010 found no significant differences between daily returns of the Russell 3000 Index and the education portfolio. In fact, there were more positive returns on the Russell 3000 Index than that of the education portfolio but the difference between the daily returns is still statistically insignificant.

A key limitation is the restriction of the study to only publicly-traded, for-profit educational institutions. Firms that traded as ADRs and those traded on non-major U.S. or non-U.S. exchanges were excluded from this study.

The lack of performance by the education portfolio, relative to the Russell 3000 Index, may be a product of the scandals associated with the for-profit education industry (for examples, see Castagnera, 2017; Deming, Goldin, & Katz, 2013; Morse, 2015; United States Government Accountability Office, 2010). Another explanation may also be a lag factor that suggests that the post-secondary enrollment levels should decline in advance of the unemployment rate declining (Hayes, 2010; Heller, 1999; Humphreys, 2000; Perna, 2000). A third contributing factor could be the quality of education delivered by the industry and the success rate of its graduates at obtaining employment after graduating (for an example, see Burnsed, 2010). Other contributing factors may include increased tuition costs and the tightening of student loan funds (Ergungor & Hathaway, 2008), either of which could lead to a decline in enrollment levels, and possibly the most recent recession's economic challenges being pronounced to the point of earning it the title "The Great Recession" (Seyfried, 2011). Each of these areas should be researched before any definitive conclusions can be determined.

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TABLE 1: DEFINITIONS

For-profit education industry	the publicly-traded entities that are classified under the NAICS code 61 (NAICS Association, 2009)
Major U.S. stock exchange	firms that are listed on the NYSE, AMEX, or the NASDAQ stock exchanges
Market	all publicly traded firms that are listed on a major U.S. stock exchange
Market efficiency	the market's ability to adjust a firm's share prices to reflect the information that is available to the public about that firm (Fama, 1970; Fama, 1991)
Recession	any segment of time that the national unemployment rate rises and exceeds 5.8% for three or more consecutive months (a variation of Boushey & Cherry, 2002)
Relative to market	a comparison with the performance of the Russell 3000 Index
Russell 3000 Index	a stock index that represents 98% of the United States equity market that is open to public investing (Russell Investments, 2011)
Unemployment factors	conditions within the market that lead to significant increases in the national unemployment rate
Unemployment rate	the national unemployment rate assigned on a monthly basis as determined by the U.S. Bureau of Labor Statistics' Division of Labor Force Statistics

TABLE 2: NAICS INDUSTRY CODES FOR EDUCATIONAL SERVICES (NAICS ASSOCIATION, 2009)

61	611310	611430	611513	611620	611692
611110	611410	611511	611519	611630	611699
611210	611420	611512	611610	611691	611710

TABLE 3: FIRMS INCLUDED IN THE EDUCATION PORTFOLIO

Ticker Symbol	Company	Primary Education Activity	Average Daily Vol[1]	Market Cap Last Quarter of 2010	Beta[2]	Prob[2]
APEI	American Public Education, Inc.	Online post-secondary	221,470	$667,005,640	0.6284	0
APOL	Apollo Group, Inc.	Campus & online post-secondary	3,701,885	$5,652,796,050	0.6353	0
ARCL	Archipelago Learning, Inc.	Software-based primary & secondary	87,840	$258,532,740	0.6072	0
BPI	Bridgepoint Education, Inc.	Campus & online post-secondary	488,306	$1,003,181,000	0.7419	0
CAST	Chinacast Education Corporation	Campus & online post-secondary	200,945	$386,285,040	0.5784	0
CECO	Career Education Corp.	Campus & online post-secondary	1,693,250	$1,683,462,570	0.7261	0
CEU	China Education Alliance, Inc.	On-site training & online	130,540	$78,047,970	0.1922	0.0521
COCO	Corinthian Colleges, Inc.	Campus & online post-secondary	2,890,745	$439,651,060	0.8047	0
CPLA	Capella Education Company	Online post-secondary	228,233	$1,085,653,480	0.6134	0
DV	DeVry Inc.	Campus & online post-secondary	1,154,649	$3,325,361,760	0.5677	0
EDMC	Education Management Corp	Campus & online post-secondary	428,553	$2,495,628,000	0.4395	0
EPAX	Ambassadors Group, Inc.	Primary & secondary educational travel	89,331	$207,388,160	1.3431	0
ESI	ITT Educational Services, Inc.	Campus & online post-secondary	1,278,523	$1,910,254,170	0.5912	0
FC	Franklin Covey Co.	On-site training & online	39,828	$146,399,370	0.6638	0
GPX	GP Strategies Corporation	On-site training & online	46,762	$191,580,160	0.5269	0
LINC	Lincoln Educational Services Corporation	Campus & online post-secondary	197,951	$332,985,000	0.6465	0
LOPE	Grand Canyon Education Inc	Campus & online post-secondary	372,658	$897,437,490	0.5370	0
LRN	K12 Inc.	Primary & secondary online	186,053	$891,956,520	0.6760	0
LTRE	Learning Tree International, Inc.	On-site training & online	43,391	$129,318,120	1.0848	0
MBA	CIBT Education Group Inc. (USA)	Campus & online post-secondary	7,035	$28,067,340	0.3725	0.0018

NLCI	Nobel Learning Communities, Inc.	Primary & secondary campus & online	10,380	$78,250,140	0.1455	0.0085
REVU	The Princeton Review, Inc.	Secondary & post-secondary education products & services	119,477	$63,130,000	0.8469	0
SPRO	SmartPros Ltd.	On-site training & online education	8,008	$11,551,380	0.1155	0.1268
STRA	Strayer Education, Inc.	Campus & online post-secondary	255,524	$1,995,552,450	0.4812	0
UTI	Universal Technical Institute, Inc.	Post-secondary campus-based	236,410	$534,887,820	0.8020	0
WPO	The Washington Post Company	Media service & campus & online post-secondary	50,032	$3,562,013,740	0.8407	0

[1] The average daily volume for the lesser of the actual 2008-2010 calendar years or the time traded during these years

[2] The stock's beta as estimated using the market model for each stock's returns on the returns of the Russell 3000 Index

TABLE 4: DESCRIPTIVE STATISTICS OF INDEX RETURNS BY PORTFOLIO

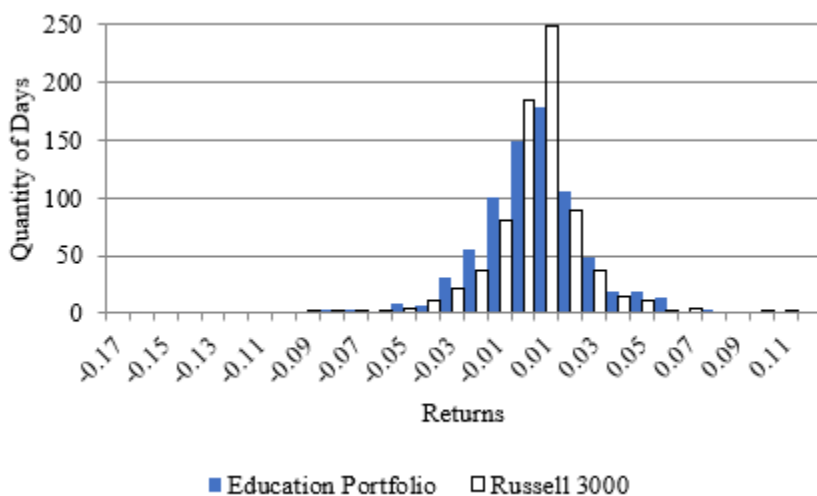|	Education Portfolio Returns	Russell 3000 Index Returns
Mean	-0.02%	-0.01%
Median	0.07%	0.08%
Standard Deviation	2.41%	1.94%
Kurtosis	5.5040	5.3109
Skewness	-0.7309	-0.2254
Minimum	-16.39%	-9.74%
Maximum	8.77%	10.86%
Sample Size	756	756

TABLE 5: TEST RESULTS FOR THE DIFFERENCES IN MEANS OF THE DAILY RETURNS ON THE FOR-PROFIT EDUCATION PORTFOLIO AND MARKET INDICES

Paired T-test			
Difference Between Means[1]			
Alternative Hypothesis	T-value	Prob level	Power*
Difference<> 0	-0.1177	0.9064	0.0516
Randomization test		0.9120	
Difference <0	-0.1177	0.4532	0.0634
Difference >0	-0.1177	0.5468	0.0390
*alpha = 0.05			
[1] Difference = Education Portfolio - Russell 3000 Index			

Wilcoxon Signed Rank Test				
	Without Correction		With Correction	
Alternative Hypothesis[1]	Z-value	Prob level	Z-value	Prob level
Diff <>0	0.8569	0.3915	0.8568	0.3915
Diff<0	0.8569	0.8043	0.8570	0.8043
Diff>0	0.8569	0.1957	0.8568	0.1958
[1] Difference = Education Portfolio - Russell 3000 Index				

Bootstrap[1]				
Estimation Results		Confidence Limits		
Parameter	Estimate	Conf Level	Lower	Upper
Mean				
Original value	-0.0093	0.9000	-0.1352	0.1223
Bootstrap mean	-0.0086	0.9500	-0.1619	0.1474
Bias (BM-OV)	0.0007	0.9900	-0.2172	0.1964
Bias corrected	-0.0100			
Standard error	0.0787			
[1] Based on 3000 samples				

FIGURE 1: DAILY RETURNS BY PORTFOLIO HISTOGRAM

[1]The education industry daily returns were measured using the index constructed for the portfolio of 26 for-profit publicly traded education firms and market is the Russell 3000 index.

FIGURE 2: COMMON-SIZE CHART OF THE MARKET AND EDUCATION INDUSTRY DAILY RETURNS[1]
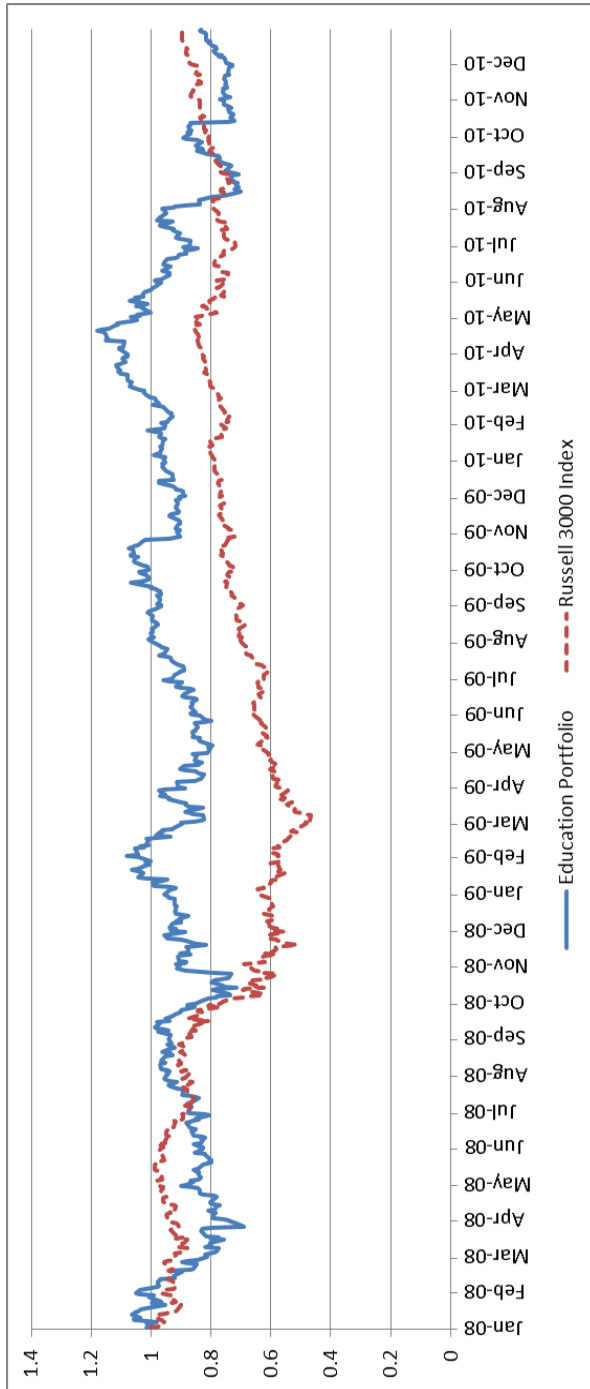
FIGURE 3: CROSS-CORRELATION OF EDUCATION PORTFOLIO AND RUSSELL 3000 INDEX