

# A Value-Added Model To Measure Higher Education Returns On Government Investment

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## ABSTRACT

*The cost of college is increasing faster than inflation with the government funding over 19 million student loans that have a current outstanding balance of over \$850 billion in 2010. Student default rates for 2008 averaged 7% but for some colleges, default rates were as high as 46.8%. Congress is demanding answers from colleges and universities about the quality of their education and the return on the government's investment. Current practices measure universities effectiveness by self-developed and measured outcomes. This system does not seem to be effective in measuring the value-added by a college education. This paper develops a model to evaluate the value-added through higher education. The model uses financial return on investment as viewed by the government lenders. A service quality model is introduced to help identify factors that are significant and easy to measure in determining a university's ability to return the government's investment.*

**Keywords:** higher education value, student default rates, student outcome measures

## INTRODUCTION

With the average cost of an undergraduate college education rising to \$15,213 for public schools and \$35,636 for private schools in 2009, more and more students require alternate forms of financing to pay for school. A majority of the financing options are from government or government backed sources. Recently, the government questioned the return on their investment (Steffen, 2010). Congress is looking to colleges to show the worth of their education in the wake of rising college tuition costs (Dillon, 2007). This has brought a renewed effort to categorize education results in terms of measurable outcomes for colleges (Miles & Wilson, 2004; College Outcomes, 2007; Dulski, Kelly, & Carroll, 2006). In response, colleges that are self-regulating are allowed to develop these outcomes and measures with little or no external requirements (Heam & Holdsworth, 2002).

This paper presents an alternative to self-developed outcomes by proposing colleges measure their value by using a financial type return on investment model. Current models' frames of reference are from the individual student perspective (Zhang, 2009). The proposed model's frame of reference is based on the perspective of the government getting a return on its aggregated educational investment in higher education.

This paper argues that using the student loan default rate is the only one true long-term unbiased external measure the government should use in determining the value of a specific college's education. Long-term student loan default rate is the only measure that cannot be influenced by colleges' self-evaluated outcomes assessment measures, retention and graduation rates, employment statistics, or student satisfaction surveys.

This paper develops a model that uses a financial approach and a service model to explain how the initial government investment is acted upon by various educational factors and gives insights on the quality of the admissions process and the quality of the educational experience. The goal is to build a predictor model to relate current academic processes to future student success as measured by a student's ability and willingness to return the government's investment.

**LITERATURE REVIEW**

Using student default rates as a measure of colleges' effectiveness is not a new concept. Volkwein and Szelest proposed it in their 1995 work (Volkwein & Szelest, 1995). Even in the 1980s, the government was screaming about high student default rates and demanded colleges do something about it. Student loan default costs increased by 1,200% during the 1980s (Volkwein & Szelest, 1995). The Volkwein and Szelest study concluded that default rates were due solely to characteristics of the students and not the college experience. However, their study was flawed because it only took into account student characteristics such as student major, GPA, and educational goals. The study did not have any factors that accounted for the quality of the education provided.

Bennett's (2001) work on assessing quality in higher education began the arduous task of determining what "value" was added by a college education. Historically, value was determined by an individual's increase in earning after attaining a college degree. Zhang (2009) continued this research by evaluating student earnings before and after college to determine if specific college factors could be attributed to these increases in earnings. She found that faculty quality was positively correlated to higher student earnings. However, the only data available was from 1993-1997. Moreover, the data was difficult and costly to acquire and analyze which resulted in only using a small sample. Zhang discovered her technique could not be scaled up to be used as a meaningful overall measure of college success. Bennett came to this same conclusion that value-added measures for colleges cannot be practically measured and postulated that the only scalable measure is the use of assessment outcomes (Bennett, 2001).

In the late 1990s, higher education looked to develop outcomes measures as a way to evaluate college success (Peinovich, 1997; Potin, 1999). In the early 2000s, more and more State regulators pushed colleges and universities to develop outcomes as a way to measure how well a school was performing (Heam & Holdsworth, 2002) and outcomes development continues as the major measure for college success today (Warren, 2003; Lechuga, Spring 2008; Syed & Mojock, 2008). However, outcomes alone have not provided a complete picture of success. Recently, other measures such as first-year retention, graduation rates, and gainful employment rates are being used as measures of college educational success (Steffen, 2010; Jacobs, 2010; Dillon, 2007; Waks, 2004; Veenstra, 2009; Hotchkiss, Moore, & Pitts, 2006). Retention and graduation rates have become so important that studies use these as measures of education success without any correlation to actual success (Allen, Robbins, Casillas, & Oh, 2008; Roman & Hahs-Vaughn, 2010).

Even with all the new measures of success, there are still grave concerns with the value-added by attending a college or university. Smelter (2009) stated that college has been dumbed down to the point it is the new high school. There are concerns that students with a college degree are overburdened by unmanageable educational debt (Jacobs, 2010), and a poor quality education (Dillon, 2007; Weiner, 2007) that lead to lack of gainful employment (Steffen, 2010). Even so, college costs continue to rise faster than inflation (Lewin, 2009).

The question now is what has caused this to be such a concern? The change in education delivery can be traced back to the introduction of the internet (Alva, Winter 1999-2000) and a plethora of educational options now available to students making it easier for anyone to attend college (Cronin & Bachorz, 2005). Before the internet, most students physically attended a university. There was a time and effort commitment required of all students. Universities were relatively small and confined to a local geographic area (Kirp, 2003). If a university did not perform (value-added education) students would not attend or the number of students graduating would not have a large effect on the workforce pool. With the advances in technology leading to online education (Stallings, July 1997), it became a favorable environment for the growth of for-profit super universities (Perkins, 2009). There were even arguments that government should help fund the growth of public/private universities (Chipman, April 2002). Even without organized government support, for-profit universities grew at a rate of 10 fold from 1998-2008 (Seiden, July 2009). Now 78 for-profit universities account for 26% of all student loans in the US (Steffen, 2010). The fast rise and growth of online education and super universities with multiple campuses across America has changed the educational landscape (Altbach, Summer 2003). However, there are no studies if these new methods are effective when it comes to academic quality (Lechuga, Spring 2008). There are even academics that argue super universities are subverting good academic practices (Waks, 2004).

With this change in higher educational landscape and the concerns from congress, government regulators and academics, it becomes essential to develop a practical way to measure value-added by higher education. Moreover, there is a need to identify and analyze critical educational factors that contribute to this value.

## **MODEL DEVELOPMENT**

The shortcomings of the Bennett (2001) and Zhang (2009) studies were the degree of difficulty they presumed was needed to find an effective way to measure value-added by a university education. Moreover, Zhang's refused to examine non-traditional viewpoints on how to measure value. One must step away from the micro view of one student and increase in student earnings and look to the real beneficiary of education, the government and society. Government believes education is necessary for society to increase quality of life. As such, government is willing to invest in individual students with the expectations that this will increase student earning potential and quality of life thus improving society one person at a time. This assumes that students take this investment with the intention of using the funds for education and be willing to pay back the government investment if able to do so. The government is willing to loan these funds because it expects the investment to generate a return to be used for future investments – new students.

A financier will recognize this as a simple **return-on-investment** model. Using this model as a starting point, one can access the relationship between investor and investment instrument. The investor is the government wanting to get a reasonable return (Hossler, 2000; Willison & Jang, 2009). The investment instrument is slightly more complicated. It involves the college and the student. However, the students must be further classified. There will be students that use the investment to complete a degree. There are also students who will use part of the investment and fail to complete a degree. The assumption is that whatever money is invested will generate a return. Students that graduate should get higher paying employment so they can pay back invested funds (Rubenstein, 1998). Students that do not graduate should have less debt and assuming that some value was added during their time at the university, the student should be able to pay back the lesser debt. This model assumes a linear relationship between debt and the value-added benefit of time attending a university. The key to this investment model is the separation of students that complete degrees and those that do not.

Now that there is an external measure of value, one needs to determine how the value is added while one is attending a university. In essence, a university is the same as any other service industry. Therefore, a **quality service model** can be used. There are several quality service models but all have essentially the same components. Service quality is determined by the quality of individual giving the service, the amount of time in contact, and the willingness (motivation) of the person receiving the service (Kalmar, 2008).

Quality of service performer (instructor) is a well documented area of research. There are studies to show faculty make the difference in educational quality (Lamer, Summer 2009), faculty culture influencing faculty performance (Lechuga, Spring 2008), faculty performance increasing student success and retention (Burgess & Samuels, 1999), faculty performance being affected by type of institution (Lechuga, Spring 2008), better quality faculty leading to higher salaries for graduates (Zhang, 2009), and colleges' efforts in retaining well qualified faculty (Dee, 2004). The service quality model gives great weight to the service provider. Finding estimates to measure instructor quality is problematic since this is such an individualized service. Past research indicates instructor quality may be determined by highest degree in field (Zhang, 2009), tenured vs. non-tenured (Zemsky, 2008), and full-time or part-time status (Burgess & Samuels, 1999; Leatherman, 1998).

In addition to instructor performance, research also indicates that necessary student support services affect the quality of the service (Abelman, Dalessandro, Janstova, & Snyder-Suhy, 2007; Coll & Stewart, 2008; Sharkin, 2004). Some studies found support services significantly increased student retention (Lau, 2003).

The amount of time available during the service period is also critical (Kalmar, 2008). In the university system how much time a professor can meet with a student is dependent on several factors. Factors include if the faculty is full-time or part-time and how many students are there for each professor (student faculty ratios).

Motivation for the student to be educated is the last factor in the service model. There are numerous studies on student motivation to success (Allen, Robbins, Casillas, & Oh, 2008; Solberg Nes, Evans, & Segerstrom, 2009; Le, Casillas, Robbins, & Langley, 2005; Allen D. , 1999). Available scholarship and loan money was also cited as a student motivator to success (Braxton, 2008). However, easy availability of federal funding was identified as a factor that could allow marginal unmotivated students access to education that were not ready for the college experience (Rubenstein, 1998; Toby, 2010). Lastly, motivation can be dependent on whether the student has chosen to attend part-time or full-time.

Based on the above, the following model of measuring the value-added by a college education is developed. The model is given below in Figure 1.

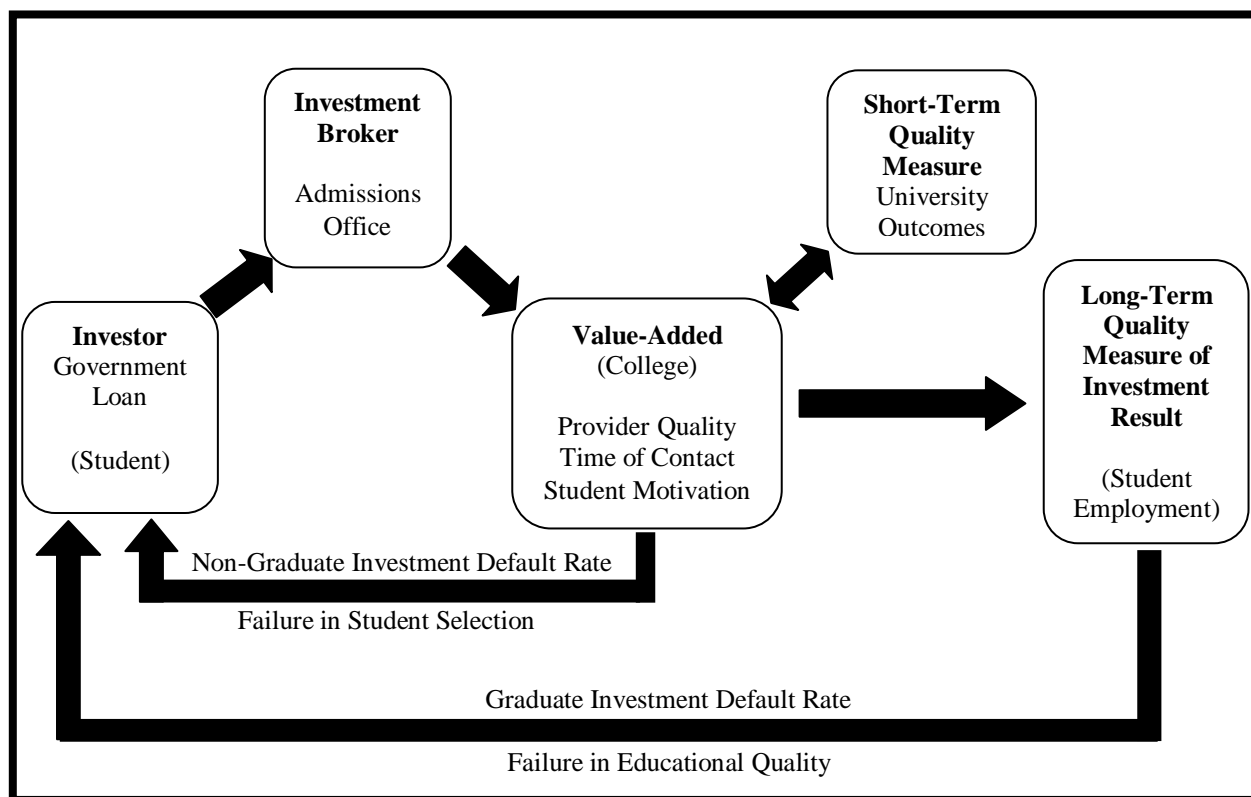


Figure 1: Value-Added Model

The model is developed from the investor (government) expecting an adequate return on the investment. The investment instrument is the student with the assistance of the college admissions office. The admissions office acts as the broker having specialized knowledge of the investment instrument. It is the responsibility of the broker to review the investment instrument to determine if it can return the investment. If the broker finds the instrument is adequate, it accepts the instrument and the investor’s funds. The value-added (college) takes the investment instrument and acts on it in such a way to increase its value (education). The instrument is evaluated in the short-term (College outcomes) as it matures. Once mature, the investment begins to return the investment in the form of payment of student loans.

Based on the above model, there are two areas the university can affect the return on investment. The first area is the broker or admissions office. If the admissions office did not select the correct student one would expect a greater non-graduate investment default rate. This would allow the investor to easily identify if the admissions policy of a university was not adequate. The second area is the quality of the education. If the college granted a

degree to a student that did not return the investment, this is an indication that the value-added for the cost of the education was not adequate. Again, this makes it easier for the investor (Government) to identify colleges that are not providing a quality education.

Supposing there was a quality of education problem with the university, it would behoove all involved to identify these major factors quickly and easily. Using the service model, one would need to measure the provider quality, time of contact and student motivation. Provider quality factors identified earlier to test are percentage of tenured faculty, percentage of terminally qualified faculty, and percentage of full-time faculty. Time of contact between student and professor can be evaluated using student/faculty ratios of part-time and full-time faculty. These data are easy to find through the Integrated Postsecondary Education Data System (IPEDS). Student motivation factors have already been identified and measured by previous research and should be taken into account during the admissions process of correct student selection.

## CONCLUSIONS

The purpose of this paper is to direct the discussion of college measures away from short-term self-developed outcomes to a value-based model in evaluating college performance. For years, colleges have tried to measure their contribution to society in various ways. With the increases in communications, online learning and the development of super universities, we are seeing fewer colleges serving large segments of the educational market. It becomes imperative that these large players ensure that the government investments in their students are returned for future generations. Unfortunately, the complexities of measuring educational values are difficult. However, applying a return on investment finance model may help identify universities that are returning the investment and universities that are not. Moreover, the above model may prove adequate in identifying major areas of improvement needed to increase investment return.

Future research will test the above model using data already being collected in the IPEDS system. The goal is to find easily identifiable variables to predict the value-added by higher education as measured by student loan default rates. The advent of super universities and their standardized practices should decrease the variation of the data and lead to indentifying measurable educational success factors using the proposed model.

## AUTHOR INFORMATION

**Roland Sparks** is an Associate Professor of Business at Johnson & Wales University in Charlotte, NC. His concentrations are in the uses of technology and the Internet as it relates to marketing. This has led him to diverse areas of study from customer relationship management systems to online learning. Sparks completed an undergraduate degree in physics and then trained as an engineer. He currently holds professional engineering licenses in New Hampshire and North Carolina. After fifteen years as an engineer, project manager and business owner, Sparks began a new career as a university professor in 1997. He holds degrees in BS physics, MBA, MS international business, Doctorate of Business Administration in international business and is a Certified Public Manager.

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