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MIDWESTERN BUSINESS AND ECONOMIC REVIEW

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ABSTRACTS

PREDICTING PLUG-IN HYBRID ELECTRIC VEHICLE ADOPTION AND DIFFUSION

This paper predicts Plug-In Hybrid Electric Vehicle (PHEV) adoption and diffusion in the United States. The research is grounded in the literature on diffusion of innovation. The models we employ originate with Bass' work. Our preferred model is the "consideration-purchase" model, suggested by Struben and Sterman (2008). The results show that by 2035 the total stock of PHEVs in the American consumer fleet could be over 47 million. However, this rests upon a price premium in current dollars of no more than $2500 for PHEVs. This implies economies of scale for PHEV production and / or incentives and subsidies.

AACSB ACCREDITATION, ACBSP ACCREDITATION AND CPA EXAM SUCCESS RATES

This research compares CPA exam success for three groups; graduates of AACSB accredited business programs, graduates of ACBSP accredited business programs, and graduates of business programs without either national accreditation. Our conclusion is that graduates of AACSB schools do better on the CPA exam than graduates of non-AACSB schools. But surprisingly, graduates of schools with no national accreditation do better on the CPA exam than graduates of ACBSP accredited schools.

PROPOSED PUBLIC HIGHER EDUCATION FINANCIAL REPORTING AND MANAGEMENT REPORTING MODEL

This paper proposes a new financial reporting and management paradigm for public higher education which is based on lean management principles that should assist administrators in complying with the Texas Higher Education Coordinating Board's challenge to become lean. The model, which organizes reporting along value streams, has been utilized in industry with beneficial results. Organizing expenditures and revenues along value streams not only provides more transparency for internal decision making but enlightens all stakeholders so as to enable better evaluation of stewardship of taxpayer funds.

PREPARING PRO FORMA FINANCIAL STATEMENTS: A SIMPLE MULTIPURPOSE EXERCISE

Students taking finance courses normally are required to have taken one or more accounting courses as prerequisites. However, finance professors often complain about the lack of accounting understanding. This paper describes a simple exercise involving the construction of pro forma financial statements based on a brief scenario that is easily grasped.

Despite its simplicity, this exercise has been effective across a wide range of students, including executives. Its main purpose is to review some simple accounting concepts and to gauge students' understanding of accounting. However, the exercise also serves as an introduction to various business concepts, especially forecasting.

PREDICTING PLUG-IN HYBRID ELECTRIC VEHICLE ADOPTION AND DIFFUSION

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INTRODUCTION

What is the probable future in the United States of efficient new types of automotive vehicles such as the Plug-In Hybrid Electric Vehicle (PHEV)? The deep recession of 2007-2009, accompanied by a spectacular spike in oil prices during 2008, and the likelihood of continuing higher oil prices in the future, have put fuel economy in the forefront of automotive purchase decisions. At the same time, recent government regulatory initiatives, at both the federal and state levels, will place added pressure on vehicle manufacturers to develop products that deliver high gas mileage and also emit smaller amounts of greenhouse gases.

An innovation that holds some promise of meeting these two criteria is a vehicle containing a plug-in hybrid powertrain. Mechanically, one likely version of this will include a large-capacity battery which will power the motor that operates the vehicle. The battery will in turn be charged by plugging it into an outlet when the vehicle is parked, and also, by a small on-board internal combustion engine. This engine will drive a generator which will then re-charge the battery; this will enable greater travel distances between the periods when the vehicle is charging from an outlet while parked. A variety of technical challenges must be surmounted before cars and light trucks with this type of powertrain are widely accepted. Furthermore, broad adoption of PHEVs will be conditioned by the capacity of the nation's electric power grid. Nonetheless, the promise of the Plug-in Hybrid Vehicle is sufficiently strong that this innovation is likely to be adopted and to diffuse across the American landscape.

But how rapidly and how widely will this new type of vehicle be adopted? Policy considerations motivate this question. The Plug-In Hybrid powertrain offers the possibility of even higher fuel efficiency and lower greenhouse gas emissions than today's best-practice powertrains, such as the current gasoline-electric hybrids (HEVs) and the advanced diesels. Given the direction of new regulations on mileage and greenhouse gas emissions, manufacturers may have to build at least some vehicles with powertrains that surpass these latter modes. At the same time, the Plug-in Hybrid is more likely to be realized in the near future than certain other powertrains, such as ones based on fuel cells.

In addition, there are theoretical reasons for exploring the likely future of Plug-in Hybrid Electric Vehicles. In this paper, the aim is to treat a new type of vehicle as an innovation, and to deploy techniques created to study diffusion of innovation in order to model the sales trajectory of that type. The literature on diffusion of innovations offers guidance, but also raises some questions. We discuss these below in the literature section. We believe the effort to extend models of diffusion of innovation to PHEVs will lead to including improvements to such models and thus to a fuller understanding of them.

Predicting the adoption of the PHEV rests on understanding its likely market acceptance. To explore this, we participated in a project that included both data collection and analytical modeling. First, consumers were surveyed to collect information on their attitudes and beliefs about PHEVs (Curtin et al. 2009). Then the project deployed two types of modeling. One type involved simulating the dynamics of consumer adoption using a complex system model (or agent-based model); see Sullivan, et al. (2009) for the report on this. The other type, the primary subject of this article, used market models to predict the adoption and diffusion of PHEVs. For the report on this part of the project, see McManus and Senter (2009).

Several considerations make predicting the adoption and diffusion of PHEVs difficult. Revealed preference data (derived from the actual market choices that consumers make) are generally the best information for generating stable and accurate forecasts. However, since PHEVs will not be introduced into the market in any substantial way until late in 2010, there are no sales data to extrapolate, and hardly any PHEV owners to interview. Information collected as part of the project by Curtin et al. (2009) includes preferences for HEVs and PHEVs. These data helped guide our thinking about PHEVs. However, for purposes of the market models we built and tested, we used data on sales of HEVs to this point in the United States.

This article is organized as follows. An overview of relevant literature is presented immediately after this introduction. Then, the market and demographic assumptions maintained in all the prediction scenarios are described. In the next section, after briefly mentioning models with a fixed saturation level, we predict PHEV adoption and diffusion using a model without a fixed saturation level: the "consideration-purchase" model, which was suggested by Struben and Sterman (2008). The paper ends with a section of conclusions and discussion.

LITERATURE

The literature on diffusion of innovations includes research on the diffusion of new consumer goods, ranging from new grocery items (Fourt and Woodlock, 1960) to cell phones (Centrone, Goia, and Salinelli, 2007). Mathematical modeling

of this process has been importantly influenced by Bass' paper (1969), which in turn was stimulated by Bass' reading of Rogers (1962) on the topic. In the model Bass initially developed, the size of the market does not change. Expansion of sales of the product is linked to two processes: oral communication among the buying public, and communication via advertising. Bass also argued that consumers can be divided between innovators and imitators. The former tend to be the first consumers to buy a new product; later, the imitators follow their lead.

Elaboration of the model by others has been done to overcome various restrictions of it; see Mahajan, Muller, and Wind (2000) for a review of this work. Nevertheless, as Centrone, Goia, and Salinelli (2007, p. 248) remark, only a limited amount of research has been devoted to analyzing markets that are not fixed, but may be growing (or shrinking). (For an example, however, see Goswami and Karmeshu, 2004.) Centrone, Goia, and Salinelli (2007) present a recent extension of the model; in this, they examine the impact of the percentage of adoptions already made in the market, for example. Bass (2004) himself has published an overview and an evaluation of the model. A strong example of methodological work on the models is Mahajan and Sharma (1986).

DEMOGRAPHIC AND MARKET ASSUMPTIONS

This section explains the common set of market and demographic assumptions that we developed. The assumptions describe the household market for all light vehicles for 2010 through 2050, including sales of new vehicles, growth in the installed base of all light vehicles, and scrappage rates for all light vehicles. We started with the 2010-50 forecasts of vehicle stocks and sales presented in the Annual Energy Outlook (U.S. Department of Energy (2009)). Since the Annual Energy Outlook forecasts include vehicles owned by business and government, as well as by households, we adjusted our forecasts to exclude business and government vehicles by using U.S. Bureau of Economic Analysis (2009) and U.S. Census Bureau (2007).

Total sales of new vehicles to households are shown in Figure 1 as the sum of growth in the installed base plus replacements for scrapped vehicles. Sales to households are expected to be below trend until 2015, with growth in the installed base bearing a disproportionate share of the shortfall. After 2015, the household installed base of vehicles is expected to return to its long-term growth rate of just over 1 percent per year, and the scrappage rate of the installed base of vehicles is expected also to return to trend at about 5.3 percent per year.

MODELS WITH AND WITHOUT A FIXED SATURATION LEVEL

The Benchmark Models

"Unconditional forecasts based on a data-based estimate of a fixed saturation level form a difficult benchmark to beat." – Meade and Islam (2001)

We initially constructed several models that each had a fixed saturation level, that is, a fixed upper limit to the size of the market (McManus and Senter, 2009). We developed a scenario prediction for each benchmark model under the common set of market and demographic assumptions with assumed parameter values that we derived from an analysis of sales of Hybrid Electric Vehicles (HEVs) for 2000-08. This method of forecasting technology adoption is called forecasting by analogy (Schnaars 2009). For an earlier example of the use of data on analogous products to develop estimates, see Mahajan and Sharma (1986). We assume that the situation of PHEVs with respect to adoption is similar enough to the historical situation of HEVs so that they are analogous. We also assume that the products are not so similar that they could be considered simply sequential generations of the same product. The data are provided in Table 1. Equations for these models, as well as material on the HEV adoption parameters, are available from the corresponding author. Also see McManus and Senter (2009) for fuller detail. Analysis was performed using Stata Statistical Software (StataCorp (2007)).

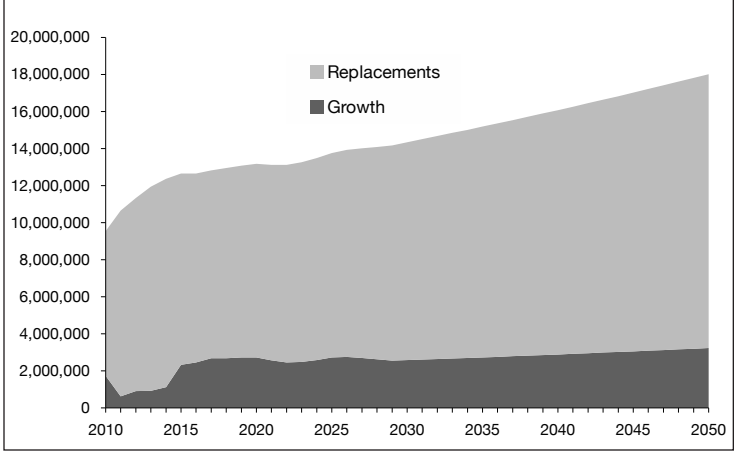
Discussion of Results with a Fixed Saturation Level

The benchmark models imply a small market for the PHEV, ultimately no more than two to four million units in a total light vehicle fleet of over 200 million. All the benchmark models are theories of adoption as a social process. That is, they explain the movement of consumers from the potential social group to the adopter social group. However, the models are usually estimated using sales and cumulative sales, ignoring both replacement purchases of the new product technology by past adopters and defections by past adopters to the old technology. In the first few years after the new technology is introduced, this approach is accurate since the vast majority of sales are likely to be first-time adoptions. However, as the market matures, sales include a growing fraction of replacements by prior adopters, and the rate of adoption, moderate though it is in our benchmark models, is overstated.

Models without a Fixed Saturation Level

We believe that in reality, the saturation level of some products is not fixed, and can be influenced by various factors. Therefore we developed a model we call the "consideration purchase"

Figure 1: Annual U.S. Sales of New Vehicles to Households



model, suggested by Struben and Sterman (2008). This incorporates factors from the domains of consumer choice and vehicle stock-flow dynamics.

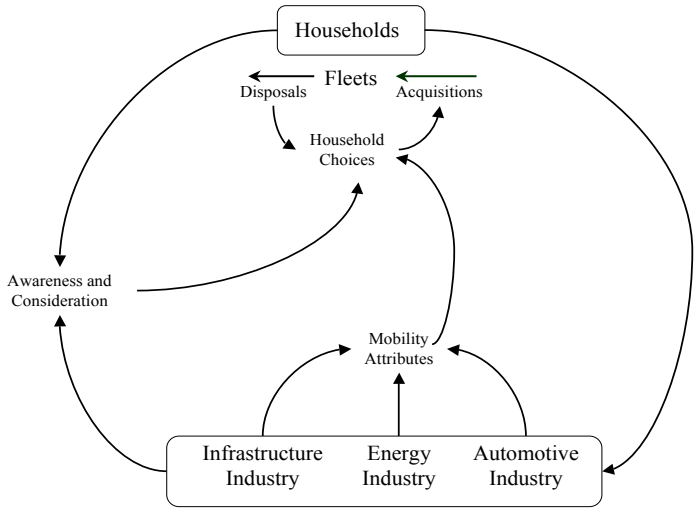
The consideration-purchase model builds on the strengths of the benchmark models and of another model, suggested by Centrone et al. (2007), that does not have a fixed saturation level. At the same time, the consideration-purchase model overcomes some of the limitations of these other models. Our goal was to link the advantages of discrete choice and diffusion models. Our model explicitly incorporates a consumer choice component that can be expanded well beyond its current simplified form. This highly simplified form was chosen to match the "choice experiment" in the PHEV survey (Curtin et al. 2009). The model also accounts for the dynamics of vehicle sales, stock, and scrappage.

The schematic diagram of the model is shown in Figure 2. At the top, households manage their fleets of vehicles (the installed base) through disposals and acquisitions. The model aggregates all households into a "representative" household, so we do not, in this paper, address the used vehicle market, and disposals are assumed to equal scrappage. Demand for new vehicles consists of growth in the installed base and replacements for scrapped vehicles.

Table 1: Historical HEV Data

Historical Hybrid Electric Vehicle (HEV) Data					
Year	HEV Sales	Cumulative HEV Sales	Total Household Vehicle Sales	Price Premium	Reduction in Cost per Mile ($)
1999	0	0	12,880,000	0.0%	0.000
2000	9,367	9,367	13,234,000	4.4%	0.043
2001	20,282	29,649	13,062,000	4.4%	0.031
2002	36,035	65,684	12,831,000	4.4%	0.029
2003	47,600	113,284	12,699,000	4.4%	0.032
2004	84,199	197,483	12,869,000	4.5%	0.038
2005	209,711	407,194	12,932,000	4.5%	0.047
2006	252,636	659,830	12,593,000	22.2%	0.049
2007	352,274	1,012,104	11,662,000	22.2%	0.050
2008	312,386	1,324,490	9,545,000	22.2%	0.055

Figure 2: Schematic Diagram of the consideration–Purchase Model



The household choices node in the diagram combines willingness to consider alternative vehicle types and a discrete choice utility model. To the left, awareness and consideration of PHEVs are influenced by their penetration in household fleets. We model the willingness of owners of conventional vehicles to consider PHEVs as a self-reinforcing process. In choosing their next vehicle, households weigh a complex set of attributes that span the vehicle itself, the availability and cost of energy (both electric and gasoline), and the road infrastructure. Personal vehicular mobility is jointly supplied to households by the three industry sectors shown: automotive, energy, and infrastructure. The arrow on the right going from households to the industry sectors represents financial and other feedback that guide the industries. The arrow connecting the industry sectors to awareness and consideration represents the potential to influence (and speed up) consideration through education, advertising, and other means.

Mathematically, the consideration-purchase model is contained in a set of equations, (1) through (6). The dynamics of the household fleets are defined in (1). The total installed base of household vehicles, V, consists of two types: conventional vehicles, V0, and PHEVs, V1. The annual growth in the total installed base is derived from our market and demographic assumptions. We split total growth between V0 and V1 in proportion to their share of the total stock. The disposal rate of conventional vehicles is close to that of the overall total stock rate (5.3%), reflecting the maturity of the conventional products. The disposal rate for PHEVs is assumed to start at zero with the launch, and to rise gradually toward the 5.3% overall rate as the PHEV market matures.

The overall vehicle dynamics:

$$V_t = V_{0,t} + V_{1,t}$$
$$V_t = V_{t-1} + \gamma(t)V_{t-1} - \delta_0(t)V_{0,t-1} - \delta_1(t)V_{1,t-1} \quad (1)$$

For each of the vehicle types, the installed base in period t is equal to the installed base of the same type in period t-1, minus scrappage of the same type, plus new sales of the same type.

Dynamics of V0 and V1:

$$V_{0,t} = V_{0,t-1} - \delta_0(t)V_{0,t-1} + S_{0,t}$$
$$V_{1,t} = V_{1,t-1} - \delta_1(t)V_{1,t-1} + S_{1,t} \quad (2)$$

Market demand for new vehicles consists of customers in four situations: replacing a conventional vehicle (V0 owners), replacing a PHEV (V1 owners), adding a vehicle to an all-conventional fleet, and adding a vehicle to an all-PHEV fleet. (This is an attempt at a simple explanation. What we are doing is splitting overall fleet growth between V0 and V1 in the same

ratio as V1 and V0 are to each other in the installed base.) The δ parameters are scrappage rates, the γ parameters are growth rates, and $\prod_{ij}$ is the probability that an i-owner buys a j-vehicle (whether replacement or growth) conditional on the i-owner's willingness to consider the j-vehicle. We assume, following Struben and Sterman (2008), that all consumers consider the conventional vehicle, and that all PHEV owners returning to the new-vehicle market consider a PHEV replacement purchase.

The sales equations:

$$(3)\quad \begin{aligned} S_{0,t} &= \prod_{00}\delta_0(t)V_{0,t-1} + \prod_{10}\delta_1(t)V_{1,t-1} + \prod_{00}\gamma(t)V_{0,t-1} + \prod_{10}\gamma(t)V_{1,t-1} \\ S_{1,t} &= \prod_{01}\delta_0(t)V_{0,t-1} + \prod_{11}\delta_1(t)V_{1,t-1} + \prod_{01}\gamma(t)V_{0,t-1} + \prod_{11}\gamma(t)V_{1,t-1} \end{aligned}$$

The discrete choice probabilities for PHEV (V1) owners are functions of the relative utilities only (with u0=0), since all PHEV (V1) owners are assumed to consider both PHEV (V1) and conventional (V0).

$$(4)\quad \begin{aligned} \prod_{11} &= \frac{\exp(u_1)}{1+\exp(u_1)} \\ \prod_{10} &= 1-\prod_{11} = \frac{1}{1+\exp(u_1)} \end{aligned}$$

The discrete choice probabilities for conventional (V0) owners are functions of the relative utilities and the willingness to consider the PHEV (V1), $w(t) \le 1$.

$$(5)\quad \begin{aligned} \prod_{00} &= 1-\prod_{01} = \frac{1}{1+w(t)\exp(u_1)} \\ \prod_{01} &= \frac{w(t)\exp(u_1)}{1+w(t)\exp(u_1)} \end{aligned}$$

We apply a Bass-type model to describe the dynamic behavior of the willingness of owners of conventional vehicles to consider the PHEV. The differential equation and the solution are familiar.

The differential equation and its solution:

$$w'(t) = (a+bw)(1-w)$$

$$(6)\quad w(t) = \frac{1-e^{-(a+b)t}}{1+(b/a)e^{-(a+b)t}}$$

For a given price, the consideration-purchase model has three parameters: the coefficient of innovation in the willingness of conventional owners to consider the PHEV (a), the coefficient of imitation in the willingness of conventional owners to consider the PHEV (b), and the exponential utility of the PHEV (exp(u1)). We assume that exp(u1) is the same for all consumers, whether they are conventional owners or PHEV owners.

Our assumed parameter values are in Table 2. The coefficients of innovation and imitation in willingness to consider the PHEV were estimated with the historical HEV data with the value of the exponential utility of the HEV implied in the consumer survey that we conducted. The values of exponential utility of the PHEV at each of the price premiums for PHEVs tested in the survey ($2,500; $5,000; and $10,000) were estimated using the average stated purchase probabilities.

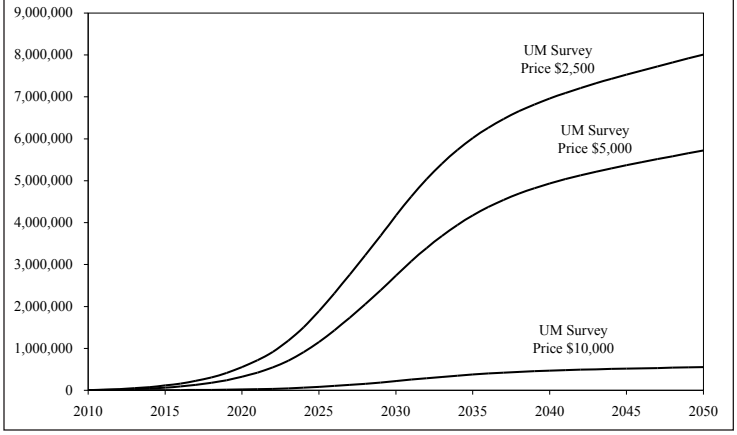
Our consideration-purchase model predictions for PHEV sales at the alternative price premiums are shown in Figure 3. The extreme sensitivity of PHEV sales to price is the most obvious result seen in the figure. Five years after introduction, in 2015, sales range from 118,793 units (at a price premium of $2,500) to 4,726 units (at a premium of $10,000). The range grows rapidly. Fifteen years after introduction, in 2025, sales range from 1,891,576 units (at a price premium of $2,500) to 84,341 units (at a premium of $10,000). Twenty-five years after introduction, in 2035, sales range from 6,021,141 units (premium equals $2,500) to 379,615 units (premium equals $10,000).

Our consideration-purchase model predictions for PHEV stocks at the alternative prices are shown in Figure 4. The extreme sensitivity of PHEV sales to price carries over to stocks. Five years after introduction, in 2015, stock ranges from 309,060 units (at a price premium of $2,500) to 12,294 units (at a premium of $10,000). The range grows rapidly. Fifteen years after introduction, in 2025, stock ranges from 8,043,578 units (premium equals $2,500) to 337,756 units (premium equals $10,000). Twenty-five years after introduction, in 2035, stock

Table 2: Assumed Parameters of the Consideration-Purchase Model

Coefficient of Innovation in W (a)	0.00075
Coefficient of Imitation in W (b)	0.28036
exp(u1) with Price = $2,500	0.80336
exp(u1) with Price = $5,000	0.46723
exp(u1) with Price = $10,000	0.15804

Figure 3: Survey Price Scenario Predictions of PHEV Sales
(No Fixed Saturation Levels)



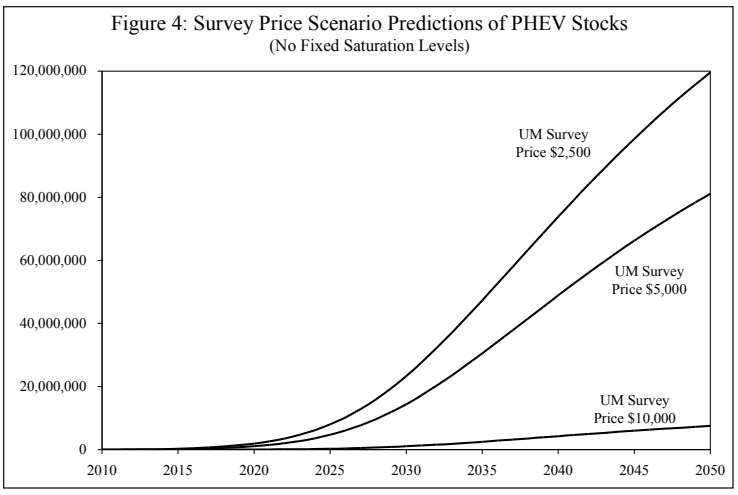
ranges from 47,379,752 units (premium equals $2,500) to 2,533,909 units (premium equals $10,000).

SUMMARY OF RESEARCH FINDINGS; DISCUSSION

In this research, we examined predictions of PHEV adoption and diffusion derived from market models.

We developed the consideration-purchase model to build on the strengths of the benchmark and Centrone models, while overcoming some of their limitations. The consideration-purchase model explicitly incorporates a consumer choice component that can be expanded well beyond its current simplified form. Our simplified form was chosen to match the "choice experiment" in the PHEV survey (Curtin 2009). The model also accounts for the dynamics of vehicle sales, stock, and scrappage.

Market penetration of the scope predicted by the consideration-purchase model would have an important downward impact on gasoline use in the United States, in addition to a useful net effect on greenhouse gas emissions. We must add that market penetration of this scope would also require some elaboration of the U. S. electric power grid. Nonetheless, we must point out that the maximum diffusion of PHEVs requires that the price premium of this type of vehicle be no more than about $2,500 in current dollars. The consideration-purchase model predictions are very sensitive to price premiums. Automotive manufacturers may be able to move toward this $2,500 number through economies of scale, as annual sales of PHEVs increase over time. Furthermore, the manufacturers, under pressure to achieve increasing fuel efficiency across the fleets of vehicles they sell, may in effect set prices that subsidize PHEV sales to some extent. At the same time, if the U. S. government remains serious about achieving the ambitious fuel economy goals it has established for future years, it may need to consider extending the credits it has created for vehicles with hybrid powertrains. In other words, government subsidies for PHEVs may be important. Our confidence in these conclusions is undergirded in part by the conclusions reached by the researchers (Sullivan et al. 2009) who conducted another part of our project. Their agent-based modeling approach also indicated the likelihood of substantial PHEV market penetration in the United States, but stated clearly that this would depend upon subsidies and/or incentives.



We believe the consideration-purchase model offers the opportunity to take into account a variety of factors in predicting the diffusion and adoption of innovations. One such factor, not pursued in this paper, is market region. In future research, using available survey data from the project, we can model differences in diffusion of PHEVs by region in the United States. We suspect less densely populated regions, such as considerable parts of the southwest, will have somewhat higher adoption then more densely settled regions, as the former regions are marked by higher annual mileage driven per vehicle.

We are aware of the limitations of the data base we used. However, at this time it offered the best opportunity for modeling the future of PHEVs. We think that the consideration-purchase model holds promise for marketing practice as well as for manufacturing planning, in that it offers tools to develop predictions of adoption and diffusion (of various types of goods) over multi-year time spans. Simultaneously, we consider it a useful step in creating models that can capture the range of variables that are significant factors in adoption and diffusion of innovation, and thus is helpful in the intellectual journey of understanding adoption and diffusion. Given the importance of innovations in energy use (for fields such as transportation, manufacturing, information technology, and the operation of buildings), developing better models to understand the adoption and diffusion of such innovations is crucial to prediction and planning.

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AACSB ACCREDITATION, ACBSP ACCREDITATION AND CPA EXAM SUCCESS RATES

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INTRODUCTION

The *Association to Advance Collegiate Schools of Business-International (AACSB)* is the nation's oldest and largest accrediting agency of business schools. However, another accrediting agency, the *Association of Collegiate Business Schools and Programs (ACBSP)* has recently come to the forefront and begun accrediting business schools as well. While the ACBSP has fewer member schools than the AACSB, it has in fact accredited an impressively large number of smaller business schools in recent years.

The promotional literature provided by the AACSB and the ACBSP asserts that the accreditation process is intended to lead to higher quality business education. Both accrediting agencies have independently developed sets of standards whose purpose is to improve the quality of business education at member schools. Although there is some commonality to the standards of the two agencies, specific standards do differ in content and emphasis.

There has been little empirical evidence to date, on the part of either accrediting agency, to support the claims that accreditation in fact leads to higher quality business education. The purpose of the research presented here is twofold. First, we ask whether graduates from AACSB accredited business schools, on average, evidence higher quality than graduates of ACBSP accredited business schools as demonstrated by superior performance on the newly computerized uniform certified public accountants exam. Second, we investigate whether graduates from accredited schools evidence, on average, higher quality than graduates from business schools not accredited. We have chosen the uniform CPA exam as one operational measure of quality in accounting education because success on the CPA exam has long been recognized as the single, best indicator of accounting skills and business knowledge necessary for entry into the accounting profession. Passing the uniform CPA exam is a regulatory requirement in all 54 U.S. jurisdictions for licensure as a Certified Public Accountant. When a school's CPA exam success rates are above average, they are often cited, by university administrators and accounting faculty alike, as evidence of high quality accounting education.

The next section of this paper outlines the history (and the quality standards) of both the AACSB and the ACBSP. This is preceded by a brief description of the uniform CPA exam and our use of it as an operational measure of quality in accounting education.

HISTORY OF AACSB INTERNATIONAL AND THE CPA EXAM

AASCB Accreditation and Standards

The *Association to Advance Collegiate Schools of Business-International* (AACSB) is considered by many to be the world's foremost accrediting agency of collegiate business programs. AACSB International states on its web site that, "*The mission of AACSB International is to advance quality management education worldwide through accreditation and through leadership*" (AACSB, 2008). AACSB further states that, "*Accreditation focuses on the quality of education*" (AACSB, 2007, p. 1).

Founded in 1916, AACSB established its first standards for business administration in 1919. To achieve AACSB accreditation a business school must meet standards in three major areas: Strategic Management Standards, Participant Standards, and Assurance of Learning Standards. Strategic Management Standards include the school's mission statement. This statement must be reflective of input from various stakeholders including students, alumni, parents, employers and administration. The mission must include the production of intellectual contributions. It must specify the intended student population to be served and emphasize a high priority on continuous improvement. Finally, the strategic management standards require the school to have financial strategies to provide the necessary resources to achieve the mission (AACSB, 2007, p. 13).

Critics of AACSB accreditation standards contend that they place too much emphasis on the publication records of faculty. These critics believe the focus on publications results in less time being directed toward teaching and interactions with students. Many collegiate business programs that do not have AACSB accreditation status claim that they are "teaching" oriented institutions. This implies that students at these institutions will have a better classroom experience. They will point to classes taught by "regular" faculty, not graduate students, and relatively small class sizes rather than large auditorium classes to support these contentions.

Defenders of the AACSB publication standards contend that active engagement in scholarly research actually contributes to the overall strengths of a given teaching faculty. Indeed, Bell, Frecka, and Solomon found a positive correlation between an instructor's research output and the instructor's scores on

student evaluations (Bell et al., 1993). On the other hand, in a Letter to the Editor of *Strategic Finance*, Gene Smith criticizes the AACSB faculty accreditation standards. Smith believes that the majority of practicing accountants would concur that an individual with an MBA or MACC, good teaching skills, minimal research skills, and 10-plus years of practical work experience as an accountant makes a better accounting instructor than the publishing Ph.D. who has little, if any, significant relevant "real world" experience. (Smith, 2007). Programs that do not have AACSB accreditation would tend to have more instructors with the qualifications Smith prefers.

ACBSP Accreditation and Standards

Many institutions believed there was a need for a national business program accreditation that had excellence in teaching as a focus rather than a strong research focus. This led to the establishment of the Association of Collegiate Business Schools and Programs (ACBSP). According to its website, ACBSP "*is the leading specialized accreditation association for business education supporting, celebrating, and rewarding teaching excellence*." (ACBSP, 2009). As of August 2008 there were 585 ACBSP member institutions of which 413 had earned ACBSP accreditation.

ACBSP was founded in 1988 by its members "*to fulfill a need for specialized accreditation by institutions of higher education with business schools and programs. Specifically, that need was for business education accreditation based on the mission of the institution and of the respective unit, an accreditation that acknowledged and emphasized quality in teaching and learning outcomes.*" (ACBSP, 2009).

At that time, only about 11% of collegiate business programs were fully accredited by the AACSB. Many of the remaining institutions felt that an alternative organization with an accrediting philosophy more attuned to the missions of their institutions should be established. Most of the non-AACSB accredited institutions "*had (and still have) as their primary, student-oriented objective, excellence in teaching as opposed to a heavy emphasis on research. They wanted an accrediting organization that had this teaching emphasis reflected in its accreditation standards. Their response was the creation of ACBSP.*" (ACBSP, 2009).

ACBSP's stated mission is to develop, promote and recognize best practices that contribute to continuous improvement of business education and accredit qualified business programs. Its vision is to be the global leader enhancing the quality of business schools and programs focused on teaching excellence. While emphasizing teaching excellence, ACBSP "*acknowledges the importance of scholarly research and inquiry and believes that such activities facilitate improved teaching. Institutions are strongly encouraged to pursue a reasonable mutually beneficial balance between teaching and research.*" (ACBSP, 2009). ACBSP also encourages faculty to have current, practical real-world experience to enhance the quality of classroom instruction and to contribute to student learning.

ACBSP's accreditation standards are based on the Baldrige National Quality Program and its Criteria for Educational Performance Excellence. There are six Standards and Criteria specified by the ACBSP. They are: Leadership, Strategic Planning, Student and Stakeholder Focus, Faculty and Staff Focus, and Educational and Business Process Management. (ACBSP, May 2008, pp. 16-42.)

The *Leadership* standard requires administrators and faculty to lead and be involved in creating and sustaining values, business school or program directions, performance expectations, student focus, and a leadership system that promotes leadership excellence. The *Strategic Planning* standard specifies that the business school or program must have a process for setting strategic directions to better address key student and program performance requirements. This process should lead to an action plan for deploying and aligning key plan performance requirements as well as encouraging and recognizing innovation and creativity.

The *Student and Stakeholder Focus* standard requires that the business school or program have a systematic procedure to determine requirements and expectations of current and future students and stakeholders, including parents, employers, alumni, donors, other schools, communities, etc. The *Measurement and Analysis of Student Learning and Performance* standard requires an outcome assessment program with documented results and evidence that the results are being used for continuous improvement.

The *Faculty and Staff Focus* standard relates to the protocol of developing and implementing a process for achieving the quality, number, and deployment of faculty and staff. This criteria establishes faculty qualification requirements which include: providing opportunities for faculty development to ensure scholarly productivity and fostering an atmosphere conducive to superior teaching.

The sixth ACBSP accreditation standard is *Educational and Business Process Management*. This standard specifies what often is referred to as a common core of basic business subject matter including economics, and government relations. In addition, students are encouraged to study global topics. This standard also requires that financial resources, physical facilities, library, and computer resources be adequate to support a strong curriculum and excellence in teaching.

AACSB vs. ACBSP

A comparison of the specific implementation guidelines of the two accrediting agencies reveals that there is little difference regarding many requirements. Commenting on a comparison between itself and AACSB, an ACBSP publication claims "The major difference between these two accrediting bodies is AACSB has a greater focus on research in their accreditation requirements while the ACBSP accreditation process has a greater focus on teaching excellence." (ACBSP, August 2008, p. 6).

Table 1 summarizes the number of business schools having 15 or more graduates who sat for the 2006 uniform CPA exam by type of business school accreditation and by size of the school's undergraduate enrollment.

Several things can be noted from Table 1. First, among U.S. colleges and universities with 15 or more candidates who sat for the 2006 uniform CPA exam, the AACSB had accredited a larger percentage than the ACBSP—almost eight and a half times as many. Second, at schools with undergraduate enrollments larger than 10,000 students, 90% are accredited by the AACSB, only 1% are accredited by the ACBSP, and 9% are not accredited by either. The dominant position of the AACSB, in terms of accreditation, is most pronounced in larger schools. Table 1 also makes evident that generally very small universities are less likely to have business programs accredited at all. Even so, more than 55% of all U.S. schools with enrollments between 2,000 and 5,000 students (and 15 or more candidates sitting for the 2006 CPA exam) are presently accredited by either the AACSB or the ACBSP. Taken together these numbers show the strong presence of accreditation in U.S. business schools, and also the dominant position of AACSB with respect to accreditation at the nation's larger business schools.

Uniform CPA Examination

According to the American Institute of Certified Public Accountants' website, the mission of the CPA examination is "*to admit individuals into the accounting profession only after they have demonstrated the entry-level knowledge and skills necessary to protect the public interest in a rapidly changing business and financial environment*." Passing the CPA exam is widely recognized by accounting graduates as being personally prestigious and critical to career advancement even for those having no intention of ever becoming licensed auditors in a public accounting firm. CPA exam success has been a long standing regulatory requirement for licensure as a CPA in all fifty-four U.S. jurisdictions (50 states plus Washington, DC, Puerto Rico, American Virgin Islands and Guam). Since its inception in 1917, the uniform CPA exam has achieved world-wide acceptance as the most prestigious indicator of preparedness for entry into the profession of accounting. One group of influential accounting organizations states that, "*since 1917, the Uniform CPA Examination has proven to be a highly valid and reliable measure of candidate abilities. This focus on quality has made it possible for all United States jurisdictions to rely on the results in determining who is competent to practice public accounting in order to protect the public*." (NASBA, AICPA, and Prometric, 2007, p. i).

TABLE 1

All U.S. FOUR YEAR COLLEGES AND UNIVERSITIES WITH 15 OR MORE ACCOUNTING GRADUATES SITTING FOR THE 2006 UNIFORM CPA EXAM

UNDERGRADUATE ENROLLMENT*	Accredited by AACSB	Accredited by ACBSP	Not Accredited by Either	Total Number of Schools
Over 10,000 enrolled	196	2	19	**217**
5,001 - 10,000 enrolled	105	9	28	**142**
2,001 - 5,000 enrolled	58	26	62	**146**
2,000 or less enrolled	4	6	26	**36**
TOTAL SCHOOLS	**363**	**43**	**135**	**541**

** -- the source of data is the intersect of the published list of AACSB International accredited business schools with NASBA's listing of U.S. four year colleges and universities having 15 or more candidates sitting for the 2006 uniform CPA exam*

The status associated with passing the CPA exam is significantly related to the difficulty of doing so. Admission to take the uniform CPA exam is granted only after successful completion of numerous college level business and accounting courses which are the equivalent of a four year business degree with a concentration in accounting. Most states also now require some form of the "150 hour rule." This rule requires candidates to earn a bachelors degree (normally 120 semester hours) with a concentration in accounting, plus an additional 30 semester hours of college study before sitting for the CPA exam and/or before licensure. These additional hours may be at the undergraduate or graduate level. It is possible that the candidate could complete all required accounting and business course requirements during the 120 semester hour undergraduate period and not take any additional accounting or business courses to fulfill the additional 30 hour requirement. This was not the intent of the 150 hour legislation, but it is possible for candidates to do.

In spite of the extensive educational requirements prerequisite to taking the exam, first time candidates have low pass rates compared with other major professional exams. When first time candidates were required to take all four parts of the exam in one, two day sitting, fewer than half of all candidates passed the entire exam in their first attempt.

The educational requirements to sit for the CPA exam, as well as the format and content of the exam, have changed significantly in recent years. Responsibility for updating CPA exam content rests with the Board of Examiners of the American Institute of Certified Public Accountants (AICPA). Although each of the 54 jurisdictions in the U.S. determines education, experience, and residency qualifications to sit for the exam, all candidates sit for the **same** exam and all exams are graded uniformly across jurisdictions. Some states have separated the requirements needed to sit for the exam from the requirements to become a CPA or obtain a license to practice as a CPA. In these states a candidate can take the CPA exam after satisfying the bachelor's degree requirements and before earning 150 semester hours.

A major revision to the CPA examination was implemented in April of 2004. (Other changes were implemented in July, 2011. We will outline the 2011 changes at the end of this article. The research presented in this paper is based on the revisions made in 2004. We do not believe the relatively minor 2011 changes would change the results of our study.) The April 2004 revision created, for the first time, an entirely computer-based CPA exam. In addition to the new computer based format, the revised CPA exam added an emphasis on demonstrating skill sets believed necessary to operate as a professional accountant in a rapidly changing business environment. The Board of Examiners described the newly evaluated skills sets as:

1. COMMUNICATION: the ability to effectively elicit and/or express information through written or oral means.

2. RESEARCH: the ability to locate and extract relevant information from available resource material.

3. ANALYSIS: the ability to organize, process, and interpret data to provide options for decision-making.

4. JUDGEMENT: the ability to evaluate options for decision-making and provide an appropriate conclusion.

5. UNDERSTANDING: the ability to recognize and comprehend the meaning and application of a particular matter.

The revised 2004 CPA exam continued to test for general business and accounting knowledge, but reorganized the knowledge domains tested into four new parts. Examiners required candidates to pass four exam sections described as follows (NASBA, et al., 2007, p21.):

1. AUDITING AND ATTESTATION (4.5 hours): (AUD) – This section covers knowledge of auditing procedures, generally accepted auditing standards and other standards related to attest engagements, and the skills needed to apply that knowledge in those engagements.

2. BUSINESS ENVIRONMENT AND CONCEPTS (2.5 hours): (BEC) – This section covers knowledge of general business environment and business concepts that candidates need to know in order to understand the underlying business reasons for, and accounting implications of, business transactions, and the skills needed to apply that knowledge.

3. FINANCIAL ACCOUNTING AND REPORTING (4.0 hours): (FAR) – This section covers knowledge of generally accepted accounting principles for business enterprises, not-for-profit organizations, and government entities, and the skills needed to apply that knowledge.

4. REGULATION (3.0 hours): (REG) – This section covers knowledge of federal taxation, ethics, professional and legal responsibilities, and business law, and the skills needed to apply that knowledge.

In the April 2004 revised exam format each section, except for the Business Environment & Concepts section, consists of approximately 70% multiple choice questions and two simulations worth 30%. The Business Environment & Concepts section is 100% multiple choice.

This 2004 revised exam format introduced simulations to test accounting knowledge. Simulations are condensed case studies using real life work-related situations. They require the candidate to demonstrate basic computer skills, knowledge of common electronic spreadsheets, word processing, the ability to use a spreadsheet to perform standard financial calculations, and the ability to use electronic tools such as databases. Additionally, some simulations require the candidates to write a business letter or memorandum. The skills that simulations are intended to measure are: analysis, judgment, communication, and research. This is a significant change from the previous versions of the CPA exam, both in content and format.

In a joint 2004 press release from the AICPA, NASBA, and Thomson Prometric the three parties contend that the new CPA exam tests real-world abilities and ensures that CPA candidates have the necessary skills to be successful. In that press release Arleen Thomas, AICPA Vice President of Professional Standards and Services stated, "*The computer-based CPA exam is more closely aligned with the real-world requirements of entry-level CPAs. Moreover, the exam now enables us to evaluate a candidate's research, analytical, judgment and communications skills, which are essential in a CPA's daily work.*" (AICPA, et al, 2004).

Accounting programs employ many measures to assess learning outcomes. The uniform Certified Public Accountant examination (CPA exam) is one measure that is often used. Whether it should be used as an assessment measure is open to debate. Schick, an academic, makes the argument that CPA exam results should be used, in part, to evaluate undergraduate accounting education.

"Since students and/or their parents are paying a significant amount of money for the education that students are receiving, you think of students and parents as customers for a university's services. Therefore, you think it appropriate for accounting departments to provide the education desired by their paying customers, students and parents. If students want to become CPAs, then accounting departments should seek to help them do so. The success of accounting departments in satisfying their customers' wants, as indicated by first-time candidates' performance on CPA exams, should be information that is widely disseminated and easily obtainable." (Schick, 1998).

In response to Schick's comments, Price Waterhouse partner, Lawrence Ponemon, expressed strong reservations for using the CPA Exam for assessing the effectiveness of college level accounting programs based upon the following reasons:

1. The exam is not a complete measure of accounting knowledge, aptitude or mastery.

2. Many high quality accounting programs in the United States do not focus solely on the public accounting career track for students.

3. The vast majority of today's accounting majors will not work in the public accounting field.

4. Major accounting firms have shifted some recruiting focus away from individuals with an accounting degree.

5. Overreliance on one exam may hinder the development of innovative curriculum and teaching approaches.

6. Directing teaching toward the CPA exam specifications implicitly shifts the burden of curriculum design to the AICPA and the State Boards of Accountancy. (Ponemon, 1998)

Despite his reservations, Ponemon agreed that the CPA exam has proven to be a reliable and valid assessment tool for technical accounting, financial reporting and auditing topics that should be well understood by entry level public accountants.

Whether totally appropriate or not, CPA exam success has been used as a key indicator of quality in accounting education both inside and outside the academic community. NASBA annually publishes *Candidate Performance on the Uniform CPA Examination*. The majority of that publication reports CPA exam success rates by school. Those colleges and universities with relatively high pass rates routinely publicize these results in student recruiting presentations and materials. State CPA societies publicly acknowledge that they rely on NASBA's reported CPA exam success rates to determine student scholarships that are awarded to various colleges and universities within their jurisdictions. De facto the CPA exam success rates have been and continue to be a key measure of quality in accounting education.

Accreditation and Quality Business Education

At first glance AACSB business school/program accreditation standards seem fully consistent with advancement of the quality of business and accounting education. However, as previously discussed, critics of the AACSB contend that AACSB's quality standards place too much emphasis on faculty research and publication and the Ph.D. credential itself at the expense of effective classroom teaching and professional work experience. These critics contend AACSB standards too often lead to the promotion and tenure of poor classroom teachers with strong publication records to the detriment of more capable classroom teachers with real-world business experience but no Ph.D.

Smith (2007) believes one result of the AACSB's strong emphasis on intellectual contributions by faculty (and on the Ph.D. credential itself) is a system that does not adequately recognize or reward effective classroom teaching. He further believes real world practical experience in the accounting arena is short-changed. Overall, Smith suggests the AACSB accreditation process has resulted in a net detriment to business education. Non-accredited or ACBSP accredited business schools or programs often obliquely make this argument by claiming that, unlike AACSB accredited competitors, they remain focused on effective classroom teaching. This implies that students will encounter better classroom teachers and higher quality classroom experiences than at AACSB institutions which have a more research oriented faculty. Non-accredited or ACBSP accredited institutions also point to classes being taught at their institutions by faculty who are interested in the art of teaching, and not by graduate students or faculty researchers who view teaching as merely necessary to justify research programs. This is not to say that non-AACSB programs never use teaching assistants, but their use is minimized compared to their AACSB counterparts. Non-accredited or ACBSP accredited schools also tend to emphasize smaller class sizes in contrast to large auditorium classes offered at some large research institutions.

Protagonists of the AACSB accreditation process counter these arguments by saying that active engagement in scholarly research actually contributes to and fosters engaged faculty teaching and improves that teaching. Indeed, Bell, Frecka, and Solomon (1993) report a positive correlation between research output by faculty and higher scores on student evaluations. Proponents of the benefits of business school accreditation, both AACSB and ACBSP, further contend that accreditation standards in their entirety place a strong emphasis on program assessment and continual improvement. They contend that business programs without any separate business accreditation are more likely to use part-time practitioners who work at their "regular" job all day and teach one night class, sometimes with little classroom training or supervision.

What seems clear is that differing opinions do exist inside and outside academe as to the overall impact of AACSB accreditation on the actual quality of undergraduate business and accounting education. This is what led to the formation of the ACBSP. Will a set of accrediting standards that emphasizes excellence in teaching over research lead to better learning outcomes? Will a faculty with recent, relevant, work experience, but not as many Ph.Ds. be equally successful in preparing business students for their careers?

PREVIOUS STUDIES

We did not find any previous studies of CPA exam results for ACBSP accredited business schools or programs. We found two earlier studies based on the pre-April 2004 CPA exam format that investigated the relationship between AACSB accreditation and CPA exam success rates. The two studies reached different conclusions with respect to the relationship between CPA exam success and AACSB accreditation. Grant, Ciccotello, and Dicke (2001) reported a positive relationship between AACSB business school accreditation and CPA exam success rates. Specifically, they reported on average, a 7.653% higher pass rate at AACSB accredited business schools for first time candidates passing at least two of the four parts of the CPA exam. A second study by Boone, Legoria, Seifert, & Stammerjohan, (2006) reached a different conclusion. Boone et. al. reported only a weak association between program-level pass rates and AACSB accreditation after eliminating the effects of selectivity when admitting students.

The current authors have published two studies related to the April 2004 revised form of the CPA exam. Using the same database as the current paper, we found that graduates from AACSB accredited business schools had significantly higher pass rates on all four sections of the CPA exam, had a significantly higher proportion of students passing all sections taken, and had a lower proportion of students not passing any sections taken. (Morgan, Bergin and Sallee, 2008) The same study also showed that when comparing AACSB accredited programs with similar sized (large, medium, small sized programs) non-AACSB accredited programs, the AACSB accredited program graduates performed better on all parts of the exam compared to their similar sized counterparts.

In a separate study we compared CPA performance by graduates of AACSB business programs that have earned separate accreditation for their **accounting programs** with AACSB to AACSB accredited business schools without the separate (and additional) accounting program accreditation. We found that graduates of AACSB accredited business schools that also have additional accounting program accreditation have higher success rates on the CPA exam than graduates of AACSB accredited programs without the separate accounting program accreditation. (Morgan, et al, 2009)

MOTIVATION FOR THIS RESEARCH

Our research was motivated by several questions. First we had a desire to know whether graduates from today's AACSB accredited business schools average higher pass rates on the newly revised computerized uniform CPA examination than graduates of ACBSP accredited business schools. Second we hoped to determine whether graduates from nationally accredited business schools or programs, whether AACSB or ACBSP, have higher pass rates on the new computerized uniform CPA exam than graduates from business schools that do not have separate national business accreditation.

Our study differs from earlier studies in several ways. First, the relationship between accreditation (including both AACSB and ACBSP programs) and CPA exam success rates within the context of the post-April 2004 revised CPA exam has not yet been reported. Second, our study is the first to compare the two accrediting agencies, AACSB and ACBSP directly, and in terms of the relative performance of their business school graduates' on the uniform CPA exam. Third, our investigation includes a larger and more recent sample of accredited schools than the two earlier studies. The group of schools compared here includes many recently accredited schools---the AACSB reports a 45% increase to the number of accredited business schools since the year 2000. Because recently accredited schools tend to be smaller in size than those accredited long ago, the relationship between both types of accreditation and CPA exam success rates may be changing.

RESEARCH DESIGN AND DATA SELECTION

In this section we describe the research design, data selection methods, and methods of data analysis used. Results of these components then immediately follow.

Business schools included in our analyses were selected from colleges and universities intersecting two existing databases. The first database was Institute of Education Sciences, National Center for Education Statistics, 2006-2007. This U.S. government database provides a list of all four-year colleges and universities located within the United States (and District of Columbia) in 2006-2007. National Center for Education Statistics also provided undergraduate enrollment at each institution. We selected all colleges and universities labeled as four-year undergraduate colleges and universities. Two-year colleges, and graduate universities (i.e. universities having more graduate students than undergraduate), were excluded from analyses.

The second database, whose intersection with the first, determined our final sample, was *Candidate Performance on the Uniform CPA Exam, 2007 Edition* published by the National Association of State Boards of Accountancy (NASBA, 2007). This database reports annual CPA exam success rates for each of the nation's colleges and universities. Our final sample included all four-year undergraduate colleges and universities (from National Center for Education Statistics, 2006-2007) listed in the *Candidate Performance on the Uniform CPA Exam, 2007 Edition* as having 15 or more graduates sitting for the 2006 uniform CPA exam. Since *Candidate Performance on the Uniform CPA Exam* reported overall success rates (as opposed to raw numbers), we excluded schools having fewer than 15 candidates as the basis for calculating the average success rate of a program. We concluded that success rates at schools calculated with fewer than 15 candidates were too unstable for inclusion. For example, imagine a school that has a single candidate sitting for the CPA exam and passes all parts. This school would be reported as having a 100% success rate. In the following year the same school might have another candidate sitting for the CPA exam who fails all parts of the exam. That school would now be reported as having a 0% success rate on the CPA exam. Neither rate, (i.e. 100% or 0%), would be a stable or accurate indicator of the school's long-term average CPA exam success rate. Because of the potential for instability that goes with small numbers, schools with fewer than 15 candidates forming the basis of their average success rate were excluded from the study. Accordingly our final sample consisted of 541 four-year undergraduate colleges and universities each having 15 or more accounting graduates sitting for the 2006 uniform CPA exam.

The 541 selected schools were next classified into one of three (mutually exclusive) groups: 1) AACSB accredited business schools; 2) ACBSP accredited business schools, and; 3) business schools not accredited by either the AACSB or the ACBSP. Classifications were determined by consulting the AACSB International on-line website listing of member schools, and also the ACBSP on-line website listing of member schools in February 2008. A summary of the 541 schools according to accreditation status and their undergraduate enrollments has been provided in Table 1 above.

All statistical analyses were conducted with one-way analysis of variance (ANOVA). ANOVA is a well known test statistic for comparing the means of two or more groups for the purpose of rejecting a null hypothesis. In the present case we wished to reject the null hypothesis that mean CPA exam success rates were no different across the three groups tested. After rejecting the null hypothesis, we compared the mean success rate in each group to the other two groups in post hoc comparisons based on least significant differences (LSD) tests. The dependent variable in all comparisons was a group's average CPA exam success rate on the 2006 uniform CPA exam. Analyses were performed with two separate reported success rates from NASBA (2007)—candidates "passing all parts of the exam taken" and candidates "passing no parts of the exam taken". These two success measures were evaluated at each of our three accreditation categories: 1) AACSB accredited business

Table 2
ANOVA (n=541)

Dependent Variable		Sum of Squares	Df	Mean Square	F	Sig.
Passed All	Between Groups	3981.427	2	1990.714	15.341	.000*
	Within Groups	69813.133	538	129.764		
	Total	73794.560	540			
Passed None	Between Groups	12344.781	2	6172.390	29.085	.000*
	Within Groups	114173.605	538	212.219		
	Total	126518.385	540			

*-statistically significant difference

Table 3
Mean Pass Rates and Standard Deviations By Condition (n=541)

Dependent Variable		N	Mean	Std. Deviation
Passed All	AACSB Accredited	363	27.7341	11.50018
	ACBSP Accredited	43	18.5228	9.84516
	Not Accredited	135	24.0939	11.54686
Passed None	AACSB Accredited	363	41.3211	14.17546
	ACBSP Accredited	43	57.4233	16.07706
	Not Accredited	135	47.8698	15.10565

Table 4
POST HOCS Multiple Comparisons-Least Significant Difference Tests (n=541)

Dependent Variable	(I) Accreditation Status	(J) Accreditation Status	(I-J) Mean Difference	Std. Error	Sig.
Passed All	AACSB Accredited	ACBSP Accredited	9.21131	1.83719	.000*
		Not Accredited	3.64025	1.14834	.002*
	ACBSP Accredited	AACSB Accredited	-9.21131	1.83719	.000*
		Not Accredited	-5.57106	1.99474	.005*
	Not Accredited	AACSB Accredited	-3.64025	1.14834	.002*
		ACBSP Accredited	5.57106	1.99474	.005*
Passed None	AACSB Accredited	ACBSP Accredited	-16.10218	2.34946	.000*
		Not Accredited	-6.54870	1.46854	.000*
	ACBSP Accredited	AACSB Accredited	16.10218	2.34946	.000*
		Not Accredited	9.55348	2.55094	.000*
	Not Accredited	AACSB Accredited	6.54870	1.46854	.000*
		ACBSP Accredited	-9.55348	2.55094	.000*

*-statistically significant difference

schools; 2) ACBSP accredited business schools, and; 3) business schools not accredited by either the AACSB or the ACBSP.

RESULTS

Table 2 shows one-way ANOVA results for the sample of 541. The null hypothesis is rejected ($p.< .01$). Mean CPA exam success rates across the three groups tested are not identical. Table 3 shows the means and standard deviations of the three groups. Table 4 presents results of post hoc comparisons—comparing each group to the other two. Homogeneity of variance between groups (a required assumption in ANOVA) was tested using the Levine statistic and found acceptable.

Table 4 results show AACSB accredited business schools have significantly higher mean pass rates (i.e. passed all parts), and significantly lower mean failure rates (i.e. passed no parts), than either ACBSP accredited business schools and business schools with no business program accreditation whatsoever. AACSB accredited business school graduates scored best on the CPA exam of the three groups. Surprisingly, ACBSP accredited business school graduates evidenced significantly lower mean pass rates (i.e. passed all parts), and significantly higher mean failure rates (i.e. passed no parts), not only when compared to AACSB graduates, but also graduates of business schools with no business program accreditation whatsoever. The ACBSP business schools scored lowest on the CPA exam of the three groups.

IMPLICATIONS AND CONCLUSIONS

Our results demonstrate a systematic positive association between higher pass rates on the revised (post April 2004) computerized uniform CPA exam and AACSB accreditation status. Accounting graduates of AACSB accredited business programs have the highest overall average CPA exam pass rates of the three groups followed by business schools without any accreditation whatsoever. Surprisingly, business schools with ACBSP accreditation have the lowest average pass rates of the three groups. Our findings bolster arguments of proponents of AACSB accreditation who believe AACSB accreditation has an overall positive impact on business school quality at least within the specific context of CPA exam success rates. Our evidence is inconsistent with critics of AACSB business school and accounting program accreditation who contend the net effect of AACSB accreditation on business education has been detrimental. Our findings also suggest ACBSP business school accreditation is not presently associated with higher quality business education within the specific context of CPA exam success rates. We offer no explanation for this result.

Data reported here convey not only statistically significant relationships, but surprisingly large differences in CPA exam success rates across groups. AACSB accredited business school graduates evidenced pass rates on all parts taken at an average of 9% higher than graduates from ACBSP accredited business programs. This is especially impressive after remembering the overall average pass rate on all parts taken by all candidates in 2006 was only 26%. Equally impressive are the lower failure

rates (i.e. failed all parts) evidenced by graduates from AACSB accredited business schools. AACSB graduates demonstrated failure rates of all parts taken a full 16% lower than the failure rates evidenced by ACBSP graduates. The magnitudes of these differences support the value of AACSB accreditation in terms of student learning when compared to ACBSP accreditation. Business schools competing regionally or nationally for students and resources may increasingly seek AACSB accreditation to remain competitive. Differences in CPA exam performance among graduates of AACSB accredited and ACBSP accredited colleges and universities, once they become more widely understood (a likelihood) may increasingly affect students' choices of universities to attend, affect choices made by funding agencies to fund certain competing institutions over others, and will affect choices made by recruiters about where to spend their recruiting resources to recruit accounting talent. It can be anticipated that institutions will increasingly seek AACSB accreditation for reasons of reputation alone.

At the same time, we caution against over-generalization from this data. We saw in the raw data cases of ACBSP accredited schools with higher than average CPA exam success rates and also cases of AACSB accredited business schools with lower than average CPA exam success rates. Accreditation, in and of itself, is no guarantee of high success rates on the uniform CPA exam. All that we conclude from our analyses is that **on average** CPA exam success rates at AACSB accredited business schools are higher than the average success rates at ACBSP accredited business schools. Graduates of AACSB accredited programs also score higher on the CPA exam than graduates of business schools with no accreditation whatsoever, but surprisingly graduates of ACBSP accredited schools do not.

Additionally, readers should remember there is nothing is this data to suggest causality in the reported association. Our research design has been correlative and has not provided a basis for causal inference. Causal inference requires an experimental design in which the researcher actively manipulates a research variable across randomly selected and assigned subjects. Only by administering to random groups, can the researcher can observe the systematic effects of a differentially administered variable and assume other systematic differences among groups are absent because of random assignment. Inferences about causal effect of the administered research variable are possible only because all other systematic differences between groups have been eliminated through random selection and assignment.

Because our research variable of interest (CPA exam success rates) was not actively manipulated and because subjects were not randomly assigned to groups (AACSB accredited, ACBSP accredited, and not accredited) only a correlative design has been achieved. Correlative designs describe systematic relationships between variables but without making any causal inferences concerning their relationship (Bryman and Cramer, 2005).

We noted earlier that Boone, Legoria, Seifert, & Stammerjohan, (2006) found only a weak association between CPA exam success and AACSB accreditation after removing the effects of certain other variables that might alternatively explain higher CPA exam rates at AACSB accredited business schools. In the Boone study eliminated variables included academic aptitude of entering students (i.e. selectivity), hours of accounting and business coursework completed, faculty research productivity, institutional resources, and several other similar items. After removing the effects of these other variables, only a weak association remained between program-level CPA exam pass rates (using the old paper based CPA exam) and AACSB accreditation. In our view, this result is not particularly surprising or important since AACSB accreditation itself seems inextricably linked to the factors they eliminated (i.e. selectivity of entrants, hours of course work required, faculty research productivity, resources available, etc.) In fact as we see it, AACSB quality standards are directly aimed at many of these very same items. To remove the effects of such things from accreditation is to leave behind a mostly empty shell, and it is not surprising to us there would remain little difference between accredited and unaccredited groups after removing them.

Subsequent to the period of this study the CPA exam format was changed again. Effective July 1, 2011 the AUD section testing period was reduced by 30 minutes while the BEC section was increased by 30 minutes. The AUD, FAR and REG sections have each reduced the multiple choice questions from 70% to 60% of the section score while increasing the simulations from 30% to 40% of the section scores. The BEC section has decreased the multiple choice questions from 100% of the section score to 85% of the score. Three new simulations account for the remaining 15%. The BEC section will now be the only section that tests written communication skills. (NASBA, AICPA, and Prometric, 2011). We do not believe these format changes would change the results of our study. But, of course, future research based on the latest revisions would be required to confirm this.

Back to our main point and to repeat it. Our intent was not to suggest a causal relationship between AACSB business school accreditation and CPA exam success rates. Nor was our intent to explicate a theoretical model showing the specific factors important to this relationship. Rather, our more modest intent has been to discover and describe observable systematic relationships between business school accreditation (of two types) and CPA exam success rates within the context of the new computerized CPA exam. This we have succeeded in doing. To the extent that CPA exam success rates indicate quality in business education, AACSB business school accreditation is associated with high quality business education. ACBSP business school accreditation is not.

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PROPOSED PUBLIC HIGHER EDUCATION FINANCIAL REPORTING AND MANAGEMENT REPORTING MODEL

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Higher education is caught in the crushing grip of upwardly spiraling costs and dwindling resources. This creates the potential for reduced educational capacity and less opportunity in a global economy where knowledge is becoming more important.

While global competition has forced industry to become lean, higher education suffers from diseconomies of scale and administrative bloat. From 1993 until 2007, administrative employees per 100 students have increased by 39.3% and employees dedicated to instruction, research and service by 17.6% (Greene et al 2010). It is no wonder that in this same period tuition and fees have risen at the astounding rate of 439% compared to only 251% in medical care (Callan 2008).

The need to alleviate the crisis is obvious, but traditional approaches to financial management in higher education have not produced breakthrough discoveries on how to resolve the issue of doing more with less. Critics have pointed to a lack of leadership within higher education (Breneman 2008). Perhaps because of a perceived lack of leadership some have suggested that change will have to come from outside of higher education (Vedder 2004). In response to the crisis, the Texas Higher Education Coordinating Board (THECB) recently issued a report that included a recommendation to promote a change to a lean culture in higher education, as well as a charge to seek improved efficiencies in delivery as well as administration (THECB 2010).

Innovation in accounting for higher education is beginning, but at a snail's pace. Responsibility-based budgeting (RBB) is an approach that seeks to decentralize financial management and link it with academic authority so that authority and financial responsibility are equalized (Strauss and Curry 2002). RBB requires the construction of financial statements by academic units, such as a college or academic department. Direct and indirect costs are allocated to the units so that academic units can be evaluated on the basis of their respective revenues and expenses. Indirect cost allocation methodologies in RBB are determined by the chief business officer of the university. RBB should create a more entrepreneurial approach and provide for more financial control at the academic level. It has been implemented with some success (Scarborough 2009). While this is a step in the right direction, it does not go far enough.

Some universities are beginning to adopt strategies that have included a lean management philosophy. Accountants can leverage the effects of lean through Value Stream Accounting (VSA), which integrates accounting and lean management concepts that has worked well in for-business contexts.

Lean Management and VSA

The Lean philosophy grew out of the Total Quality Management and Activity Based Management movements. It gained rapid acceptance in industry as a way of thinking that focuses management on ways to eliminate waste and, therefore, better manage costs. The basic approach is to classify activities in the organization as either value added or non-value added. The classic distinction between value added and non-value added activities is based on whether the customer would be willing to pay for the activity. While not all non-value added activities can be eliminated, the idea is to reduce or eliminate those activities to the extent possible.

Activities, whether value added or non-value added, are viewed as part of a value stream. A value stream is represented by all of the activities necessary to produce a product or service, or a family of similar products or services. In a university environment, each academic college or school within the university could be considered a value stream, even though various types of degrees are awarded by a particular college. For example, in the college of business, degrees might be awarded for Accounting, Management, Marketing, Finance, Master in Taxation, Master of Business Administration and so forth. The college of business would be considered a separate value stream.

VSA integrates with and supports lean thinking by viewing the entity as a set of separate value streams with various entity-sustaining functions that support the entity mission. Within the value stream, all costs are considered direct, thereby eliminating a major weakness of RBB which requires a methodology (assumptions) to allocate indirect costs. Any support functions and related costs that are dedicated only to the value stream are considered direct costs to the value stream.

By classifying activities within a value stream, the operations of the entity become more transparent with respect to where to focus improvement efforts. Furthermore, such a focus highlights program expenditures (academic colleges) versus administrative expenditures (entity sustaining), which is a highly used statistic to evaluate efficiency of nonprofit organizations. Nonprofit and charitable organizations routinely report this statistic as a measure of efficiency and as a means of assuring donors that their donations are being spent in high percentages toward the mission and purpose of the organization. A recent study reports that nonprofits on average spend 79% of all expenditures on programs directed at the mission of the organization (Gordon et al 2010).

VSA employed in industrial applications has proven to produce information useful for improvement (Gordon 2010; Brosnahan 2008). Furthermore, a value stream view of the entity often illustrates the need for an organizational change that erases functional department lines within the value stream and creates a value stream manager (the dean in this case) that has authority for all functions, including support functions, within the value stream. Such an organizational change streamlines decision-making and creates faster response times.

Illustration

Table 1 illustrates a value stream budget of a small regional state-supported university, Value University. Table 1 uses data from the current traditional budget, which is often difficult to understand, and converts the data to the value stream concept. Each value stream is the production system of the three elements of universities' mission: teaching, research and service. The entity sustaining costs represent the costs to administer and support the academic colleges.

The percentages shown in Table 1 are comparable to the efficiency ratios of nonprofit organizations since each value stream delivers the primary mission of teaching, research and service to the university's constituents. Therefore, based on the budget of Value University, a reader could conclude that approximately 28 cents of every dollar spent goes toward program expenditures. While this is an over-simplification of the facts for any university, it provides a starting point to evaluate and benchmark expenditure decisions in a similar fashion as they are evaluated and benchmarked for non-profit organizations. A 28% efficiency ratio for a nonprofit entity would be considered quite low. And it is doubtful that Value University is significantly different from other universities with respect to spending priorities reflected in the value stream budget.

The reality is that many of the entity sustaining expenditures are dedicated to one or more value streams but controlled by central administration and therefore not budgeted through the value streams. But if the entity is viewed through a value stream perspective and there is a desire to more appropriately cost the services provided by each value stream, it becomes apparent that the budgeting process should re-distribute some expenditures from entity sustaining to one or more of the value streams.

A value stream income statement can be calculated by allocating revenues generated by each academic college. By calculating a contribution margin for each academic college, additional insight is gained into efficiencies and budget decisions. See Table 2. College 1 is providing about half of the total contribution margin. These circumstances should lead to a number of questions that are not immediately apparent viewing the budget or GAAP produced financial statements.

If the university is reorganized for accounting and management along value stream lines, it obviates the need for indirect cost allocations to academic colleges. The management hierarchy becomes flatter, less bureaucratic, and more responsive.

TABLE 1
VALUE STREAM BUDGET

VALUE STREAMS	Budgeted Costs		
College 1	7,600,000		
College 2	4,000,000		
College 3	3,700,000		
College 4	3,400,000		
College 5	5,400,000		
VALUE STREAM TOTAL	24,100,000	27.70%	value stream costs to total costs
ENTITY SUSTAINING COSTS			
President's office	1,000,000		
Business Affairs	13,700,000		
Advancement	1,000,000		
Academic Affairs	7,000,000		
Sponsored Research	1,600,000		
Student Affairs	7,000,000		
Athletics	1,500,000		
Scholarships	5,500,000		
Institutional	24,600,000		
ENTITY SUSTAINING TOTAL	62,900,000	72.30%	non-value stream costs to total costs
TOTAL COSTS	87,000,000	100%	

Table 2						
	College 1	**College 2**	**College 3**	**College 4**	**College 5**	**Combined total**
Revenues						
SCH production	30,196	12,857	11,208	3,540	10,559	68,360
Revenues						
Tuition and fees	$13,002,652	$5,130,536	$4,532,894	$2,662,956	$6,062,105	$31,391,143
Research	3,865,088	453,120	1,434,624	1,645,696	1,351,552	8,750,080
Designated fees	1,509,800	642,850	560,400	177,000	527,950	3,418,000
Gifts	594,750	320,250	213,500	152,500	244,000	1,525,000
Other revenue	503,267	214,283	186,800	59,000	175,983	1,139,333
State funding	9,030,000	3,570,000	3,150,000	2,730,000	2,520,000	21,000,000
Available revenues	$28,505,557	$10,331,039	$10,078,218	$7,427,152	$10,881,590	$67,223,556
Expenses						
Total expenses	$7,600,000	$4,000,000	$4,500,000	$2,500,000	$5,400,000	$24,000,000
Contribution margin	$20,905,557	$6,331,039	$5,578,218	$4,927,152	$5,481,590	**$43,223,556**
Contribution Margin %	73.34%	61.28%	55.35%	66.34%	50.37%	64.30%
Other Revenues						
State funding for non operating						$15,300,000
Auxililiary						$5,200,000
Investment						$ 4,100,000
total Other Revenues						$ 24,600,000
Total Available for Entity Sustaining						$67,823,556
Entity Sustaining						
Presidents office						$ 1,000,000.00
Business Affairs						$ 13,700,000.00
Advancement						$ 1,000,000.00
Academic Affairs						$ 7,000,000.00
Sponsored Research						$ 1,600,000.00
Student Affairs						$ 7,000,000.00
Athletics						$ 1,500,000.00
Scholarships						$ 5,500,000.00
institutional						$ 24,600,000.00
ENTITY SUSTAINING TOTAL						$ 62,900,000.00
Excess						$ 4,923,556

Furthermore, value stream managers can now focus more clearly and armed with more relevant data on value stream activities with an eye to reduce non-value added activities.

Improved Base for Reporting and Management

If financial reports are re-formatted as illustrated in Table 2, it is most likely that the data is provided in a form that is more useful for both internal and external users. This is supported by empirical results of users' perceptions of the utility of GAAP financial reports for colleges and universities and VSA-formatted financial reports (Gordon and Fischer 2011).

VSA-formatted financial statements will provide more transparency and a greater ability to evaluate administrators' stewardship of resources at the college and university levels. Such an evaluation can lead to improvement. Additionally, VSA-type reports enable better analysis of strategic decisions and fit nicely into the managing for results paradigm suggested by GASB (Fountain et al 2003).

Universities are highly political entities that create potential for resource allocation decisions that are made on the basis of internal politics instead of strategic need. Traditional reporting through budgets and/or financial reports obscures to a great extent resource allocations and the efficacy of resource utilization. VSA provides the transparency to view the ultimate effects of resource allocation decisions and the stewardship of those resources. If VSA operating results of state-supported universities are made public, as shown in Table 2, taxpayers and other constituents will become more informed with respect to spending priorities and have a benchmark with which to evaluate stewardship of those entrusted with resources.

An entity organized and managed by value streams is an example of empowerment, long recognized as an important management tool to affect improvement as decisions are pushed down to the lowest hierarchical level possible. A value stream management philosophy equates authority and responsibility, giving the value stream manager the ability to direct all functions that effect results of operations, rather than requesting assistance from bosses from other departments who may or may not really understand the issues as well as the value stream manager. Furthermore, since the value stream manager is now empowered, he or she is directly accountable for results and more easily evaluated. These types of organizational changes in industry have proven to increase efficiencies, communication and response times.

VSA improves the ability to link strategic results to accounting reports. For example, if the university has made a particular program within a particular college a strategic priority, VSA better enables the evaluation of the university's efficacy with the implementation of that strategy. Assume that a program offered within College 2 has been made a priority by the university as a result of a perceived competitive advantage of the university. Comparing results over time for College 2 should enable the evaluation of the strategy and/or its implementation.

Finally, VSA supports and extends the benefits of RBB, which is a first step toward creating an entrepreneurial mindset within the university. If academic deans know that they have authority and responsibility for the contribution margin of their college, and that they will be evaluated on the results, costs will most likely improve.

CONCLUSION

VSA is a powerful tool to assist with continuous improvement, cost reduction and evaluation of stewardship. VSA links accounting to lean management principles, thereby promoting a lean vision. Furthermore, empirical evidence supports the notion that users, internal and external to the university, believe that VSA financial reports are more useful than traditional reporting.

The re-organization of the university along value stream lines can further leverage lean thinking and benefits. There is ample evidence in private industry that lean thinking leads to continuous improvement and creates an entrepreneurial attitude at all levels in the organization.

Finally, VSA offers the possibility of utilizing efficiency ratios similar to those of nonprofit organizations, as it creates more transparency and highlights spending priorities chosen by administrators. Use of such efficiency ratios will motivate administrators to move entity sustaining costs and operations to the value stream. Deans, empowered with authority for these costs, will be motivated to decrease all value stream costs in order to increase contribution margin of their respective colleges. The reporting model itself can drive the higher education system toward the goals mentioned in the THECB's recommendations.

Considering VSA as a strategic initiative holds promise to not only decrease costs, but improve quality as well. University business officers, presidents and legislators can become important change agents by promoting and adopting VSA.

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PREPARING PRO FORMA FINANCIAL STATEMENTS: A SIMPLE MULTIPURPOSE EXERCISE

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INTRODUCTION

In my experience in teaching finance for over 20 years, I seem to continually overestimate students' understanding of accounting. I am often surprised that students seem to have so much trouble grasping the relationship between accounting and finance. In talking to colleagues from many different institutions, this seems to be a prevalent problem.

Many years ago I developed a simple exercise requiring students to produce simple pro forma monthly income statements and balance sheets based on an easily understood scenario. I have used this exercise with undergraduate students, MBA students, and in executive education. At times I have thought "this will be too easy for this group." However, I cannot remember a single instance when the exercise was not instructive for most, if not all, of the students. Even students with significant accounting background usually find the exercise to be valuable; in fact, often the accountants in the class tend to over think it (get too wrapped up in the accounting) and lose sight of the financial implications.

THE EXERCISE

The exercise usually takes anywhere from about 30-75 minutes depending on the background of the students and the amount of coaching that I provide. The exercise does the following:

1. Reviews some basic accounting concepts
2. Provides practice in preparing simple accounting statements
3. Exposes students to monthly financial statements (some students have only studied annual statements)
4. Provides an introduction to forecasting
5. Illustrates the role and importance of forecasting assumptions
6. Illustrates the importance of financial planning/forecasting
7. Shows how the income statement and balance sheet are linked together
8. Provides practice in brainstorming alternative courses of action
9. Illustrates how there can be multiple solutions to the same problem
10. Demonstrates the difference between accounting profits and cash flow
11. Illustrates how rapid sales growth can lead to financing pressure
12. Illustrates the impact of selling terms
13. Provides a vehicle for a discussion of alternative financing sources
14. Illustrates the importance of forecasting to help obtain financing
15. Provides a good vehicle for class participation
16. Provides a good vehicle for teamwork with students who are stronger in accounting acting as coaches
17. Provides a good vehicle for early "benchmarking" of the class (if students struggle greatly with this exercise then you made need to adjust your syllabus and/or expectations)

Here is the exercise:

> Sergio likes fancy cars and has the opportunity to import and sell 3 high-priced sports cars. The cars will cost $150,000 each and the purchase terms offered by the supplier are: Net 30. Sergio will buy 1 car in August and 2 in September. He will sell the cars for $225,000 each, collecting 1/3rd of the price as a down payment and will collect the balance in 30 days. Sergio forecasts that he will sell 1 car in September and 2 in October. He will begin the business, Sergio's Imported Cars (SIC), with $30,000 cash. He will have expenses of $6,000 per month. The business will be dissolved at the end of December. Prepare monthly pro forma financial statements (income statement and balance sheet) and a cash budget for Sergio's business from August to December. You can assume a corporate form of organization. Ignore all taxes and retain all earnings.

Let me make a few initial observations. The exercise may strike you as simple in the extreme. In fact, with some groups (such as executive education) I have felt somewhat embarrassed when I put this on the board (or screen). However, I can testify to the fact that it can be highly instructive. I can't remember a single student who (after the discussion was completed) appeared to think it was not worthwhile. In creating the scenario I chose something that was tangible and easy to picture. Obviously, some students are more into cars than others, but it is something that everyone can easily grasp. Astute students may quickly see some problems for the seller, but I have been surprised over the years that even the brighter students usually do not immediately see where things are headed. Many of the students who have an initial reaction that it is seems trivial begin to change their demeanor as they start working through the exercise. Some students may not be familiar with cash budgets. I tell them that they can just list a beginning cash balance, cash in, cash out, and an ending cash balance.

Next, I will explain the sequence I use in talking through the exercise with the students, putting some of my suggested comments/instructions in quotes. The solution to the exercise is shown as Tables 1-3.

a) I first give the students a few minutes to wrestle with the exercise. Often they quickly seem puzzled, not knowing how to get started. "The financial statements will be extremely simple. You might first think about what line items you will need. You will only need a few lines on the income statement and not many lines on the balance sheet."

b) I like to do this on a chalkboard or whiteboard; it works best if you can put a list of the assumptions, the income statement, the balance sheet, and the cash budget on boards where they can all be seen at one time. However, it can be done with a document camera or multiple sheets in an Excel workbook. "So, what will the income statement look like?" At this point I get the students to identify sales, cost of goods sold, gross profit, SGA (selling, general and administrative expenses), and net income as the line items needed for the income statement. "What will the balance sheet look like?" Here I get the students to identify cash, inventory, accounts receivable, total assets, accounts payable, total liabilities, common stock, retained earnings, shareholder's equity, and total liabilities and shareholder's equity as the needed line items. I write beginning cash, cash in, cash out, and ending cash on the board as the cash budget. The exercise demonstrates how a profitable business can experience cash flow problems. The cash shortfall can be solved in a variety of ways. I try to leave some space to add an additional line (such as bank loan) above shareholder's equity. The line items I have listed are the bare minimum, which is what I like to use. However, some instructors may want to list more items to make the statements more complete.

c) “What will August look like?" Here is where some of the cash flow timing issues start to take shape. I clarify that SIC will take delivery on the first car in August, but they won't have to pay for it until September.

d) Next, I move to the September income statement. "So what are sales in September?" We then talk though how 1 car has been sold, list the related CGS figure, take account of the expenses, and arrive at the profit of $69,000. I reinforce the fact that net income is positive.

e) Students often question the $6,000 in expenses. You could say SIC has leased a small showroom and since they are selling high-end cars they offer customers a glass of wine and/or other amenities.

f) "Let's do the balance sheet for September. Let's save 'Cash' for the moment." We then talk through the inventory, A/R, and A/P situation. Here is where I like to talk about the link between the income statement and the balance sheet through retained earnings. We discuss how dividends would reduce the addition to retained earnings. I then move to the cash budget. We talk through the cash coming in (1/3 of the selling price) and the cash going out (paying for the car purchased in August and our SGA expenses). "Hmmm -- we have a problem. We're profitable, but we're bankrupt!" I let this sink in a bit, and then ask: "have we made any mistakes here?" We discuss how the accounting is correct. I try not to go much further into the cash flow timing problem at this point, because I want it to play out a bit more before we get into that discussion. "So, what do we do?" Students may propose various solutions, but usually "take out a bank loan" or "take out a loan" comes up pretty quickly. It works well if there is a banker in the class, or the instructor can just say something like "Sarah, let's suppose you're a banker." I like to force some type of loan here as a possible solution, deferring further discussion of options until later. I put in the $51,000 as "Bank loan" above Shareholder's Equity, set Cash to 0, and show Total Assets and Total Liabilities and Shareholder's Equity as $450,000. I also adjust the Cash Budget to show $126,000 as Cash In, $156,000 as Cash Out, leading to an Ending Cash Balance of $0.

g) We then work though the October income statement. Here again I emphasize the profitability pointing out that the company’s net income is $144,000.

h) We work though the October balance sheet in a similar manner as the September balance sheet, leaving Cash as the last item. Some students are surprised to see that SIC is still having cash flow problems. I then go back to the banker and get him/her to lend SIC some more money.

i) Then we get to the income statement, which shows a loss. At this point I point out that SIC made money in September, but was bankrupt, made more money in October, and that SIC is still bankrupt. Some students will probably be struggling to understand how and why this is happening.

j) The October balance sheet and cash budget show that cash flow is now turning positive. You can choose to pay down the bank loan or leave that until later. I usually say "let's leave it there for now and wait until we can pay off the whole thing." Someone in the class will usually raise the issue of interest. I acknowledge that it is a legitimate point and that we could model it, however since it is fairly small and we are really doing a ballpark forecast we can ignore it. Obviously, some instructors may choose to include the interest in the model. Depending on the group, you can get a little pressed for time so I like to leave all the side-issues until the end.

k) November and December go quickly since all the sales have been completed. The final retained earnings figure is $201,000.

l) At this point, a good question is: "Suppose someone who didn't know much about business or accounting was thinking about this whole scenario back at that beginning. How could they have known that the business would end up making $201,000?" We then talk through how $75,000 profit per car on 3 cars minus $24,000 of expenses would leave you with $201,000. It’s a good place to reinforce the value of doing whatever simple calculations or estimation is possible to double-check your calculations.

m) Next, I move into a discussion about forecasting. "How many of you forecasted yesterday or today?" There are many common examples that could be developed here such as eating a meal to avoid forecasted hunger or hitting the brakes on a highway when you forecast trouble ahead on the road. We then talk about how SIC could have developed this forecast in an effort to anticipate any future financing problems. I emphasize that the purpose of forecasting is to take action now.

n) Finally, we discuss various alternative ways that SIC could solve their cash flow problem. This is a fun exercise in brainstorming. Here is a list of various ways that students may suggest concerning how SIC could solve or mitigate their cash flow problem:

    1) Take out a bank loan -- here we discuss how the bank would probably not have been eager to loan SIC $51,000 in September and then another $6,0000 in October. We discuss how pro forma statements could be used to show a potential lender how SIC is forecasting that things will unfold. This would make the lender more confident that SIC knows how to operate a business.
    2) Borrow money from another source, such as angel investors -- see above comments
    3) Increase the initial capital
    4) Change the selling terms
    5) Offer a discount for early payment
    6) Negotiate better purchase terms
    7) Negotiate a better purchase price
    8) Get the supplier to help finance their inventory
    9) Reduce the expenses
    10) Shut down the business sooner -- the last car is sold in October with the final amount due collected in November, so things could be shut down before December. Of course, this will not solve the September/ October cash crunch.
    11) Increase the selling price -- if the price is increased or purchase terms are tightened up, we discuss how sales could be negatively affected. However, with the selling terms as stated, it would take an enormous price increase to avoid any cash flow problems.
    12) Sell more cars -- obviously, if they could sell more cars with this markup, SIC would be more profitable (in dollar terms). However, that doesn't solve their cash crunch problem unless something else is changed.

Modifications and Further Assignments

There are numerous ways that the exercise could be modified. The time period could be extended with additional sales and/ or customer payment patterns; this would allow the instructor to introduce aging schedules and the impact of changing sales patterns. An international aspect could easily be added with the cars either being purchased or sold in a foreign currency; this could then lead to a discussion of ways to hedge exchange rate risk. Students could be presented with various financing alternatives at the outset such as a bank loan with certain covenants, angel investors, a venture capital firm with an equity stake, etc.; they could then be required to produce the projections under various alternative financing plans. Students could be given an array of options for purchase terms and selling terms, and then be required to produce the projections under the various scenarios and propose a course of action. Interest calculations could be included in modeling the bank loan. The students could be required to prepare a Statement of Cash Flows, however usually board/screen space is already tight. Financial ratio calculations could be included. Additional accounting details could be added.

This exercise helps prepare students for cases dealing with forecasted financial statements. Corporate finance textbooks vary greatly in their coverage of forecasting methods. Textbooks can be supplemented with Harris (1991) or Helfert (1960). There are many cases of varying difficulty available for further assignments. The following cases could be used as fairly gentle steps forward in difficulty: Mullins (1991), Kester (1996), White and Hawkins (2002). Kester (1997b) can be used as an introduction to some of the issues surrounding seasonality. Kester (1997a) moves on to using the percentage of sales technique to prepare pro formas. Wynant and Li (2002) concerns pro forma preparation and bank loan issues in an Asian setting. Instructors wanting to dig into the construction of the Statement of Cash Flows may want to use Simons and Davila (1995). Forecasted financial statements can also be used as a stepping stone to more advanced topics such as Free Cash Flow (FCF) valuation; see Sahlman and Janover (1996) for some exercises along these lines. After students have mastered the mechanics of preparing forecasts, they can move to more advanced analysis such as assessing projections for a venture-backed startup company (see Roberts (2008)) or evaluating multiperiod forecasts associated with different financing options (see Lipson and Green (2009)).

The world of finance has changed radically in the last 50 years for various reasons. Vastly improved computing power is definitely high on a list of reasons. The article by De Vos, et.al. (1966) can help students see how the world has changed, but also see how some simple modeling insights can be useful; the ease of exploring sensitivity to forecast assumptions obviates the need for the equations in the article, but the intuition behind the equations has timeless value.

Concluding Comments

This is a very simple exercise. I think sometimes we tend to overcomplicate things in finance. Despite the simplicity, I have used this exercise very effectively with many different groups of varying backgrounds. Since some accounting courses are normally a prerequisite for finance courses, this is an exercise that I often use in the early part of a course such as the first required Corporate Finance course. I have also used the exercise in Investments courses and Financial Modeling courses. I normally do not teach International Finance, but it could also be used in that context, especially with some tweaking to include exchange rate issues. It is also an effective exercise to use in executive education, especially with a group with mixed

functional specialties. It may have been many years since some executives have had an accounting course, and it serves as a good review of some of the basics.

Finally, this exercises assists in benchmarking students' understanding of accounting. Usually you can: a) quickly identify the students who are strongest in accounting, b) identify students who are good at generating solutions to problems, c) get a sense of how comfortable students are speaking up in class, and d) get a sense of how comfortable students are in either offering or receiving help from fellow students. Unfortunately (or perhaps fortunately, because at least you are forewarned), when you get a group that struggles mightily with this exercise, then you know it's going to be a long semester.

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TABLE 1

Sergio's Imported Cars (SIC)
Completed Pro Forma

Income Statement

	August	September	October	November	December
Sales	0	225,000	450,000	0	0
Cost of Goods Sold	0	150,000	300,000		
Gross Profit	0	75,000	150,000	0	0
Selling, General, and Administrative Expenses	0	6,000	6,000	6,000	6,000
Net Income	0	69,000	144,000	**(6,000)**	**(6,000)**

TABLE 2

Sergio's Imported Cars (SIC)
Completed Pro Forma

Balance Sheet

	August	September	October	November	December
Assets					
Cash	30,000	**(51,000)**	**(57,000)**	237,000	231,000
Accounts Receivable	0	150,000	300,000		
Inventory	150,000	300,000	0	0	0
Total Assets	180,000	399,000	243,000	237,000	231,000
Liabilities					
Accounts Payable	150,000	300,000	0	0	0
Bank Loan					
Total Liabilities	150,000	300,000	0	0	0
Equity					
Common Stock	30,000	30,000	30,000	30,000	30,000
Retained Earnings	0	69,000	213,000	207,000	201,000
Shareholder's Equity	30,000	99,000	243,000	207,000	231,000
Total Liabilities & Equity	180,000	399,000	243,000	237,000	231,000

TABLE 3

Sergio's Imported Cars (SIC)
Completed Pro Forma

Cash Budget

	August	September	October	November	December
Beginning Cash	30,000	30,000	**(51,000)**	**(57,000)**	237,000
Cash In	0	75,000	300,000	300,000	0
Cash Out	0	156,000	306,000	6,000	6,000
Ending Cash	30,000	**(51,000)**	**(57,000)**	237,000	231,000

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