Financial Predictors for Sustainability Using IRS Form 990

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Abstract

The purpose of this project is to create a solution in the form of an application to estimate financial predictors for sustainability in universities. The general approach is based in model developed on doctoral dissertation [1] and creating an application that states the financial predictors of a university. These predictors were selected after revising and studying the IRS form 990. This form is used to gather information about taxes from organizations that are exempt and documents the necessary information to comply with tax laws. For this project, universities are the focus non-for-profit organizations. A particular university was used as an example to show that the calculations are correct. As a result of this project, I found finances to be a key part in ascertaining the sustainability of an university. The predictors help to know which area is lacking in support and help to find solutions to improve it.

Introduction

For the university to be economically stable to continue functioning, it needs to be informed of its financial stability and its sustainability. Financial stability is means being resistant to economic shocks and being able to fulfill the day-to-day activities [2]. Sustainability is defined as the ability to continue at a particular level for a period of time [3]. To find out about a university's sustainability, one can use the IRS form 990. This document is filed by tax-exempt organizations, nonexempt charitable trusts, and section 527 political organizations and gathers the data of gross income, receipts, and other similar information to assure compliance with the internal revenue laws [4]. One problem is that the document only the taxes from the organization. This project proposes in selecting financial predictors and creating formulas to calculate the sustainability of universities. These formulas will state if the university is sustainable or is not using three years. This data will be extracted from the IRS form 990 for the years of 2015, 2016, and 2017.

Background

To understand the information provided to this project, one has to have basic knowledge of the IRS form 990, section 527, statistics, section 501(c)(3), section 6033, and financial predictors. The basic information for the IRS form 990 is to know that the document gathers data about taxes from tax-exempt organizations. For the section 527, to know that it is filled out by political organizations [4]. Basic knowledge of statistics is needed to know how to collect, display, analyze, and draw conclusions from data. Section 501(c)(3) states that the organization must exclusively operate for exempt purposes, not involved in politics, and are referred to as charitable organizations. These include universities that are the subjects to this project. Section 6033 is about the returns by exempt organizations [5]. This means to file an annual return that includes gross income, receipts, and other similar information . Lastly, one must know about predictors, specifically financial predictors. These are variables that are part of the formulas, which help to predict if the organization is sustainable. The financial predictors in this project are tuitions and fees, federal and state appropriations, federal grants, income, sponsored research, expenditures, marketing, revenues, balance, debt, assets, endowment, and gifts.

Problem

The IRS form 990 doesn't state that the organization is sustainable, but gathers its information, educates its about tax law requirements, promotes compliance, and are used to share information to the public about the organization [6]. This gathered data can be used to see if the organization is sustainable by gathering three years of data from the IRS document and use the formulas to know of its its sustainability.

Methodology

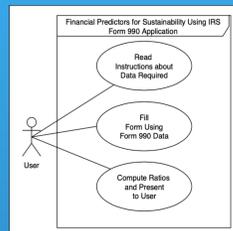The following figure is the Use Case that shows the methodology of the application.

Fig. 1: Use Cases

The following are the formulas used to calculate sustainability and create the application.

$$Equation~(1): Total~Current~Fund~Revenues =$$
$$(TuitionandFees) + (FederalAppropiations) +$$
$$(StateAppropiations) + (FederalGrants) +$$
$$(PrivateGifts) + (SupportforOperations) +$$
$$(AuxiliaryEnterprises) + (Sponsored~Re~search)$$

Fig. 2: Total Current Fund Revenues

$$Equation~(2): Total~Current~Fund~Expenditures =$$
$$(InstructionaExpenditures) +$$
$$(Full-TimeStudent) + (AcademicSupport) +$$
$$(MarketingExpenses)$$

Fig. 3: Fund Expeses

$$Equation~(3): Over~Current~Fund~Expenditures =$$
$$(DeficitCurrentFund~Re~venue)$$

Fig. 4: Over Current Fund Expenditures

$$Equation~(4): Current~Fund~Balance~(Previous~Year) =$$
$$(CurrentFundBalance)$$

Fig. 5: Current Fund Balance

$$Equation~(5): Total~Liabilities =$$
$$(LongTermDebt) + (TotalAssets)$$

Fig. 6: Total Liabilities

$$Equation~(6): Total~Assets =$$
$$(MarketValueofEndowment)$$

Fig. 7: Total Assets

$$Equation~(7): Total~Gifts =$$
$$(GiftsFromIndividuals) +$$
$$(GiftsFromOrganizations) +$$
$$(PlannedGiving) + (AnnualCampaign)$$

Fig. 8: Total Gifts

Results and Discussion

The application was created using the previous formulas to calculate sustainability for a university. The following figures show the application forms used to capture the data for each formula and the summary of the totals.

Fig.9: Total Current Fund Revenue Form

Fig.10: Total Current Fund Expenditures Form

Fig.11: Total Current Fund Expenditures Form

Fig.12: Current Fund Balance Form

Fig.13: Total Liabilities Form

Fig.14: Total Assets Form

Fig.15: Total Gifts Form

Fig.16: Sustainability Summary Form

Sustainability is determined by adding the following positive indicators: 'Income', ' Fund Balance', 'Assets', and 'Gifts'; and separately adding the following negative indicators: 'Expenses', 'Fund Expenditures', 'Liabilities'. A monotonic increase of the ratio of positive over negative indicators during three(3) or more consecutive years will be and indicator of sustainability, while a monotonic decrease will indicate a trend towards un-sustainability.

	Year 1	Year 2	Year 3
Income	1438561	7329549	35895576
Fund Balance	1234431	5241220	7400321
Assets	43021	23410	12349
Gifts	37338	76426	117045
Expenses	131782	175228	231038
Fund Expenditures	1234	9363	5433
Liabilities	20703	47766	55746
Total Positive Indicators	4753351	12668605	16073800
Total Negative Indicators	59275	131555	360432
Sustainability Ratio	80	96	100

Fig. 17: Sustainability Summary Form with Sample Results

Conclusions

The application can help predict sustainability for any university using financial predictors derived from the IRS 990 form. The application works as a desktop program for Windows and Mac computers. It is easy to use and shows the results instantly. Thanks to data collection, which is the process of measuring the information on variables of interest to be used for evaluating outcomes [7], and data analysis, which is the process of describing and evaluating data [8], the sustainability is calculated. Critical information consists of income, expenses, assets, liabilities, fund balances, and fund-raising. This form is useful because it gathers the data from any organization that operates under section 501(c)(3), as a tax-exempt organizations. Using the last three years of the IRS form 990 data, the sustainability of any organization under section 501(c)(3) can be predicted with substantial precision using this model.

Future Work

Future improvements for this project could be to add more predictors. These predictors can be economical, social, and environmental. Adding more predictors will help to ascertain with more detail and precision the percentage of sustainability that university can be afforded according to the data gathered. A second suggestion would be to use more than three years to estimate sustainability with more depth. A third suggestion would be to expand the application to work in more than one computing platform and to be more user-friendly.

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References

[1] P. G. Leaman, "Predictors of Private School Sustainability Using IRS Form 990," JMU, Harrisonburg, VA, 2016.

[2] (n.d.) *Defining Financial Stability* [Website]. Available: https://www.mnb.hu/en/finacial-stability/defining-financial-stability.

[3] (n.d.) *sustainability* [Website]. Available: https://dictionary.cambridge.org/es/diccionario/ingles/sustainability.

[4] (n.d.) *About Form 990, Return of Organization Exempt from Income Tax* [Website]. Available: https://www.irs.gov/forms-pubs/about-form-990.

[5] (n.d.) *527 Basics* [Website]. Available: https://www.opensecrets.org/527s/basics.php.

[6] (n.d.) *Form 990 Resources and Tools* [Website] Available: https://www.irs.gov/charities-non-profits/form-990-resources-and-tools.

[7] (n.d.) *Data Collection* [Website]. Available: https://ori.hhs.gov/education/products/n_illinois_u/datamanagement/dctopic.html.

[8] (n.d.) *Data Analysis* [Website]. Available: https://ori.hhs.gov/education/products/n_illinois_u/datamanagement/datatopic.html.