Lagarde University-Taking the Lead in Business Education

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Abstract:
This case study is about an institution of higher learning that is considering the option of expanding its curriculum to include a new emphasis in its academic program, and which will be offered, alongside other general course requirements, for its Bachelor degree. The institution has asked you, as a coordinator of the department, to look into the dilemma of whether to offer the new emphasis or not. Although educational institutions are expected to be non-profit, the administration desires to balance its accounts, and possibly to earn a residual. This is a strategic managerial decision that necessitates the application of principles in corporate finance. It consists of undertaking a feasibility study for the viability of an investment proposal. The case is directed to senior students in business, economics, and eventually other social specialties and fields, or to those with an advanced scholastic status. It is necessary and advisable for applicants to have a background in the mathematics of finance.

Key words: feasibility study, university new major, present values, Gordon dividend discount model, sensitivity analysis, EXCEL spreadsheet

Teaching Objectives

The main objective is to illustrate how a feasibility study can be conducted, and to dispel the notion that feasibility studies are only appropriate for firms with a profit motive. Other objectives of the case are:

- To teach and disseminate the importance of the time value of money.
- To show and introduce how discounting is utilized and the way to calculate Present Values (PV) and Net Present Values (NPV).
- To provide the basics for the Internal Rate of Return (IRR).
- To cover the decision-making criteria for PVs, NPVs, and IRRs.
- To be able to derive the PVs of annuities and perpetuities.
- To learn the Gordon-Shapiro constant growth dividend model (Gordon and Shapiro, 1956; Gordon, 1962).
- To present how imputed revenues and imputed costs can be figured out.

Research Methods

The types of data used to develop the case are a combination of general, secondary, and arbitrary origins. For example, the discount rate is taken from the literature, the tuition fees, salary expenses, salary increases, and the market cost of office facilities are from actual market figures. The imputed revenues and costs are based on institutional records, and the remaining data, like the horizon, the overhead allowance rate, and the overhauls, are arbitrary. Most data are in real, inflation adjusted, US dollars.

Assignment Questions

Present a schedule of cash flows over a 10-year period, and assume proper conditions for an unlimited perspective after that date. Cash comes from earned tuition revenues and is paid in operating expenses. Calculate the PV of revenues, the PV of expenses, the NPV of the whole project, and the IRR, and discuss the

feasibility of the academic program. Other assignments can be in preparing EXCEL data tables by varying one, or two parameters at the same time, and in finding out the sensitivity of the project characteristics to such changes.

Online Application

The case is ideal for an online instruction. It can be organized on an EXCEL spreadsheet, and can be solved directly on this spreadsheet while visualizing the media screen for online purposes. Additional mathematics and notions can be purveyed orally. The decision for the case dilemma can be discussed and obtained right away on the shared computer screen.

The University

The university, Lagarde University, is an institution of higher learning located in an emerging economy. It adopts the US liberal arts curriculum. It offers programs leading to Bachelor's degrees in the Arts and Sciences as well as Business Administration and Economics, in addition to Master's degrees in the Arts, Sciences and Business Administration. English is the main language of instruction. The university is open to all students, regardless of race, nationality, or creed, and has professors and student body from all sections of society. The Faculty of Business Administration & Economics offers a bachelor degree, with or without the following specialties: Accounting, Advertising & Communication, Economics, Finance, Hospitality Management, Human Resource, Management, and Management Information Systems. The program of study is demanding, competitive, reputable, and seeks to maintain high standards and exceptional quality education.

The administration has always been responsive to business needs, and has observed lately a flurry of demand for an emphasis in Supply Chain Management (SCM) in the work place. It is considering opening up such an emphasis. The aim is to be a leader and outstanding purveyor of business education while ensuring balanced finances. However, at first, a feasibility study is to be carried out. As the coordinator of the department you have been asked to prepare such a study. You are the central protagonist, and you are facing the important decision-making dilemma of whether to go ahead with the emphasis or not. The administration has provided you with the following information.

The Discount Rate

Since cash flows in any proposed investment occur at different periods in time, a key input in a feasibility study is to select an acceptable discount rate. One such rate is the marginal return to education which is estimated to be 9% a year (Psacharopoulos and Patrinos, 2018), but can reach double digit figures. It is likely to be higher in developing countries. However, this is a private compensation. The return to education in a college or in a setting of higher learning has notoriously positive spillovers and externalities, and these should be considered and properly weighed in the analysis. In other terms, social benefits are necessarily higher than private benefits. Accounting for these can either be by reevaluating and upping up the private benefits or, equivalently, by charging a lower discount rate while keeping the cash flows the same. This will result in a higher Net Present Value in both cases, and a higher likelihood to accept the underlying program plan. Moreover, education has the characteristics of a public good, and based on that the appropriate discount rate should be the social discount rate, which is usually lower than the return on a private or market investment. A reasonable rate for public budgets is 4% (Azar, 2007, 2009), which is obviously much lower than the private gain of 9% mentioned above. It is argued that a non-profit educational institution should not seek a material reward. Nonetheless, like any other institution, balancing the budget is a must for continuous viability, survival, and sustainability.

Revenues

(1) Enrolment in the new program starts with 8 students, and each year thereafter enrolment will increase by 8 students. A given student completes the program of study in 4 years. In year 3, the yearly enrolment reaches its steady state peak rate of 24 students (see Table 1).

Table 1: Student enrollment

Year	1	2	3	4	∞
n	8	16	24	24	24

(2) The yearly tuition per student is $ 10 K. Actually it is $ 20 K in other local universities. Despite that the school enjoys and pride itself of having smaller classes, and reaping the benefits of diseconomies of scale for overhead. Moreover, with small classes quality of education is enhanced and this is a source and an indicator of goodwill.

(3) Tuition is imputed to the department by multiplying by one half. The emphasis requires 5 courses to be completed in one year, and the total number of yearly registered courses for graduation with a bachelor degree is between 8 and 10. Hence, one additional objective of this case is to present a sound revenue allocation method.

(4) Tuition increases by 2% every year. All rates are real and not nominal values, i.e. inflation is factored out. After year 10 the percent increase in tuition remains 2% forever. There is a need to apply the Gordon-Shapiro constant dividend growth formula.[1] If tuition at year 10 is Π, if the discount rate is i , and if the growth rate is g, then the PV of tuition revenue for the years 11 to infinity is equal

$$PV = \frac{\Pi * (1 + g)}{i - g}$$

(5) Outside of tuition there are no external financing.

Expenses

(1) There are two sources of expenses, one is for faculty salaries and the other is for administrative overhead. Overhead is imputed to be on average 50% of the yearly imputed revenue from tuition. This may seem low, but for a small institution, that has a comparative advantage, and that benefits from diseconomies of scale, this is attainable. Hence overhead waste is assumed and regarded to be relatively higher in large institutions.

(2) Two faculty members are hired: A Ph.D. full-timer, and a part-time teacher with a Master's degree, both having the required expertise. The full-timer will teach a load of 2 courses of the new program each semester, which is a 50% load of his full-time contract. His annual salary is $ 60 K.[2] He will serve the rest of the load in other departments. Hence 50% of his annual salary is imputed to the department.

(3) The part-timer will teach 4 courses a year, and is compensated at $ 50 per hour. His total annual salary is $ 45x4x50 = $ 9,000, as there are 45 teaching hours for each course per semester.

(4) Every semester 4 courses in the emphasis will be offered. And every year 8 courses in the emphasis will be scheduled, four by the full-timer and four by the part-timer.

(5) Salaries for all faculty increase by 3% a year indefinitely. Again, this is a real, inflation adjusted, growth rate. If the inflation rate turns out to be 2% the annual salary increase will be revised to 5%. The Gordon-Shapiro constant dividend growth formula is applied here also. Hence, the terminal horizon cash outflow is computed and discounted by i as

$$\frac{salaries\ at\ year\ 10 * (1.03)}{i - 0.03}$$

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[1] This formula is to be found in all introductory corporate finance textbooks. See, for example, Brealey *et al.* (2018).

[2] This salary rate is lower than the one in the US for similar jobs. This is due to a lower cost of living in emerging countries.

(6) A technological overhaul of the equipment is undertaken every five years. Since technological quality improves proportionately with price, the amount of overhaul is set at a constant real figure of $ 20 K. The result is a complex perpetuity occurring once every five years. The procedure is to calculate the 5-year discount rate, and discount the perpetuity ($ 20 K) by this 5-year rate.

(7) An initial investment of $ 32 K is spent on a 4 by 4 square meter office room at a price of $ 2,000 per square meter. An additional investment of $ 18,000 in advertising, equipment, furniture, computers, brochures, and office supplies will be disbursed per year. Other administrative expenses will be part of the general administrative overhead of the whole university. This is to take advantage of a synergy in expenses across departments.

The student/faculty ratio has a commendable minimum of 8/2 = 4 and a steady state maximum of 24/2 = 12. The administration is keen to keep this ratio as small as possible to insure and provide a high quality of instruction.

Should the university open the new emphasis? The answer could be found from the Net Present Value (NPV), which ought to be positive. The NPV is easily computed in EXCEL. See Table 2. Since the major components of the budget are faculty salaries, and the discount rate, one further objective of the case is to form a "data table" in EXCEL and to vary at the same time the salary costs and the discount rate, and to estimate their impact on the NPV (see Table 2).

Table 2 presents the finances in an EXCEL spreadsheet. The first row is for the cell label, and goes from D to O, and the first column is for the cell number, and goes from 1 till 19. The period is listed in row 2., the enrolment in row 3, the tuition in thousands in row 4, the faculty total salary in row 5, the overhead in thousands, in row 6, and the net cash flow is in row 8. The discount rate is set at 11% (cell D10). The percent increase in salaries is given at 3% (cell D12). The percent increase in tuition is assumed at 2% in cell D15. The overhead imputation rate is at 50% (cell D17). The overhaul amount is in cell D19. In cell I11, the compound discount rate for 5 years is given. In column O are the values for terminal horizon cash flows, and they are included in cell N8. Cell P6 gives the PV of the overhaul amounts after year 10 each five years and indefinitely. Cell N10 gives the NPV, which is calculated to be $ 1,040, and is immaterially different from zero. Therefore, this discount rate represents the IRR. The criterion is to accept a project if the IRR is higher than the discount rate. This is satisfied as 11% is higher than 9%, and much higher than 4%. The conclusion is that the emphasis is profitable and feasible and should be opened. Moreover, budgeted cash flows are mostly positive. There are three outlays: there is an initial outlay in year 1 (cell E8), another in year 2 (cell F8), and a last one in year 5 (cell I8). So balancing the budget is quasi ensured, and no working capital or transient financing is needed.

In cells F14:P21 there is a data table which lists the NPVs. Row G14:P14 lists different values for the discount rate, from 5% till 14%, and column F15:F21 gives different values for the salary increase, from zero to 4%. As expected a higher discount rate reduces NPVs, and a higher salary increase decreases also the NPVs. The major inference is that a salary percent increase higher than 3.5% creates negative NPVs. Otherwise, the NPVs are all positive even at a discount rate of 14%. The maximum NPV, around one $ million, in the table is for a zero percent change in salaries and a discount rate of 5%. The minimum NPV is negative, around minus two $ million, and occurs with a discount rate of 5% and a percent wage increase also of 5%.

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Table 2: The EXCEL spreadsheet

	D	E	F	G	H	I	J	K	L	M	N	0	P
1													
2	year	1	2	3	4	5	6	7	8	9	10	11	
3	enrolment	8	16	24	24	24	24	24	24	24	24		
4	tuition	40.80	83.23	127.34	129.89	132.49	135.14	137.84	140.60	143.41	146.28	1657.4	
5	faculty	37.85	38.99	40.16	41.36	42.60	43.88	45.20	46.55	47.95	49.39	635.88	
6	overhead	70.40	59.62	81.67	82.95	84.24	85.57	86.92	88.30	89.71	91.14	828.92	49.2
7		108.25	98.60	121.83	124.31	126.85	129.45	132.12	134.85	137.66	140.53	1514.0	
8	net amount	-67.45	-15.37	5.51	5.58	-14.36	5.69	5.72	5.75	5.76	129.59		
9	Discount rate												
10	0.11									NPV	$1.04		
11	salary growth rate												
12	0.03					0.59345							
13								DATA TABLE					
14	tuition growth rate			0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14
15	0.02		0.000	1021.08	653.63	450.94	325.59	242.00	183.18	140.10	107.57	82.39	62.51
16	overhead ratio		0.015	828.15	523.78	357.32	254.72	186.36	138.26	103.02	76.39	55.77	39.50
17	0.5		0.020	690.33	437.22	297.74	211.10	152.98	111.84	81.55	58.57	40.73	26.60
18	Overhaul amount		0.025	506.58	329.01	226.24	160.22	114.83	82.12	57.69	38.97	24.31	12.64
19	20		0.030	249.33	189.88	138.86	100.08	70.81	48.43	31.03	17.31	6.34	-2.54
20			0.035	-136.54	4.38	29.63	27.92	19.46	9.93	1.04	-6.76	-13.44	-19.10
21			0.040	-2065.92	-644.87	-298.06	-170.53	-114.07	-86.32	-71.81	-63.93	-59.58	-57.19