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A MODEL FOR VALUATION OF GRADUATE DIPLOMAS A MICRO-MODEL FOR TEACHING PROFESSIONALS OF PRIVATE COLLEGES AND UNIVERSITIES IN THE PHILIPPINES

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Abstract: *This study developed a valuation model for a Masters diploma which was patterned after the valuation model published by Reyes. The model was based on Rate of Return on Investment or ROI. The cost function was based on the median cost of total tuition and miscellaneous fees needed to complete a Masters degree. The revenue function on the other hand was based on loading scheme at the department level and on the salary and incentive scheme stipulated in the LPU Employees Manual and Salary Scheme of the Human Resource Department of LPU Batangas. The specific variables that went into the revenue function are: hourly rate, average teaching load, over-load compensation, vacation leave cash equivalent, and separation benefits. This study corrected the model for PhD and presented the ROI for each diploma for a twenty year time period. The model was tested based on a data set collected from fifteen respondents.*

Keywords: *Graduate Degree, PhD, MA, Economic Valuation, ROI, Higher Education.*

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INTRODUCTION

Reyes (Reyes, 2013) presented a micro-model for valuation of PhD based on the teaching load assignments and general salary scheme of Lyceum of the Philippines University Batangas. This model identified the components of the revenue function, and used the median tuition fee for PhD as cost function to produce a model for ROI. The results presented in this paper serve as a correction and completion by constructing the ROI model for the Masters diploma.

RESULTS

Cost Function $\overline{C}_M$

The model proposed in this paper obtains the median cost of a Masters degree (MA) based on total enrolment feesneeded to complete the degree in various universities where LPU faculty members graduated.

Define C_i to be the total cost of an MA in university*i*.The variables *t, f, m*and *n*are defined as follows: *t* – total number of units to finish the degree, *f* – tuition fee per unit,*m*–miscellaneous fees, and *n* the number of terms/semesters to finish the program. The total cost of an MA in university *i* is given by $C_i = (tf + nm)$. For the faculty members of LPU Batangasthe population mean for the cost of a graduate diploma is chosen to be

$$\overline{C}_M = median(C_i).$$

Revenue Function R_i

The revenue function *R* involves five components: 1)*regular compensation*, 2)*overload compensation*, 3) *vacation leave cash compensation,* 4) *13th month pay*, and 5)*separation benefits*.

Define *rate* $\tilde{r}$ to be the compensation awarded to a faculty for one hour of teaching. Let r_1 be the hourly rate at the entry level of a faculty member with Bachelors degree (BA) and with only the minimum qualifications. Let r_2 be the hourly rate at the entry level of a faculty member with MAalso with only the minimum qualifications. The rate differential $\tilde{r}$ for MA is

$$\tilde{r} = r_2 - r_1$$

The rates for BA and MAincrease with time side by side with increases in student tuition fees in LPU. As a function of time this positive correlation is estimated by the regression equation

$$\tilde{r} = 0.19i + 7.8$$

The regression equation is derived from the rate increases from 2005 to 2013.

Regular Compensation R_1

The regular teaching hours for a regular faculty member in LPUBatangas is 24 hours a week. In one school year a faculty member collects 768 hours. The increase in compensation for two regular semesters received by a faculty with MA is

$$R_1 = 768 \times \tilde{r}$$

Overload CompensationR_2

The guidelines of LPU for assigning overload are based on faculty ranking which is in turn based on two components: academic ranking (50%) and performance ranking (50%). The weight of MAfor academic ranking is 7% .

Define w_t to be the weight of MAfor allocating additional teaching loads, this weight is found to be

$$w_t = 0.035$$

Define w_i as the average teaching loads from the first and second semesters of faculty memberswith BAand x_j for faculty memberswith MA, if $\overline{w}$ is the median for w_i and $\overline{x}$ for x_i, the revenue for the faculty member arising from additional teaching load for one school year is

$$R_2 = 4\tilde{r}\left(\overline{x} - \overline{w}\right)$$

Vacation Leave R_3

Regular employees are entitled to a vacation leave of five days. If this leave is not consumed it is converted to cash based on hourly rate of a faculty member. It is part of LPU management practice to pay the cash equivalent of un-used leave at the end of the second semester. For a faculty member with MA this revenue is

$$R_3 = 80\tilde{r}$$

13th Month Pay R_4

The 13th month pay is a month's salary given to employees as mandated by law. LPU computes it based on the average monthly earnings of a faculty. If $\bar{x}$ is the median load (teaching load a week), for one year a faculty member performs $32\times\bar{x}$ of teaching hours. The total revenue for one year is $\tilde{r}\times(32\times\bar{x})$ This divided by 12 yields the additional revenue that accrues to the faculty from 13th month pay. Itis computed as

$$R_4 = 2.67\tilde{r}\,\bar{x}$$

Separation Benefits R_5

The separation benefits awarded to a faculty is based on length of service, latest monthly salary before separation, and percentage payable. Percentage payable is defined in Article VII of Separation Benefits of LPU Batangas Employees Manual.(LPU Batangas, 2012)

The separation benefit function R_5 is defined as follows.

$$R_5 = 4\bar{x}\,\tilde{r}\,S(n)$$

where $S(n)$ is the multiplier for *n* continuous years of service.For corporate confidentiality reasons the multiplier function is not published in this paper.

ROI MODEL MA

The model without the separation benefit function is

$$ROI_M = \frac{B\sum_{i=1}^{n}\tilde{r}_i - \bar{C}_M}{\bar{C}_M}$$

Where $B = 848 + 3.79\bar{x} - 1.67\bar{w}$, and $\tilde{r}_i = 0.19i + 7.8$ the regression equation for yearly rate increases for MA.

The model with the separation benefit function is

$$ROIS_M = \frac{\tilde{R}_i + 4\,\bar{x}\,\tilde{r}_i\,S(i) - \bar{C}_M}{\bar{C}_M}$$

Where $\tilde{R}_i$ is the total revenue after *i* years of employment.

ROI MODEL PHD

The corrected model for PhD is

$$ROI = \frac{A\sum_{i=1}^{n} r_i - \overline{C}}{\overline{C}}$$

Where $A = 848 + 6.67\overline{y} - 4\overline{x}$, and $r_i = 0.19i + 38.26$ the regression equation for yearly rate increases for PhD.

The valuation model with the separation benefit function is

$$ROIS = \frac{R_i + 4\overline{y}\, r_i\, S(i) - \overline{C}}{\overline{C}}$$

Where R_i is the total revenue after *i* years of employment.

INITIAL TESTS

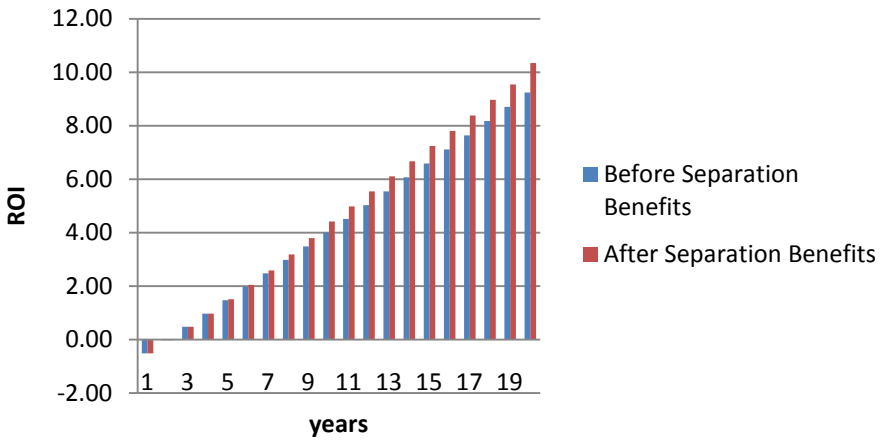
An informal survey was conducted to run the model. Pertinent data were collected from five Faculty members with PhD and five members with MA and five with only a Bachelors degree. Because of company confidentiality issues the actual values of mean teaching loads $\overline{y}$ and $\overline{x}$ are not revealed in this paper.

Based on the informal survey $\overline{y} - \overline{x} = 4.5$, and $\overline{C} = 75000$ Php. This cost is the full tuition fee of PhD in the University of Batangas.

Table 1 Return on Investment (ROI) PhD After *n* Years of Employment

n Years	ROI Before Separation Benefits	ROI After Separation Benefits	*n* Years	ROI Before Separation Benefits	ROI After Separation Benefits
1	- 0.51	- 0.51	11	4.51	4.98
2	- 0.02	- 0.02	12	5.03	5.54
3	0.47	0.49	13	5.55	6.11
4	0.97	0.97	14	6.07	6.67
5	1.47	1.51	15	6.59	7.24
6	1.97	2.05	16	7.12	7.81
7	2.47	2.59	17	7.64	8.39
8	2.98	3.18	18	8.17	8.97
9	3.49	3.79	19	8.71	9.55
10	4.00	4.42	20	9.24	10.35

Figure 1 ROI PhD After n Years of Employment

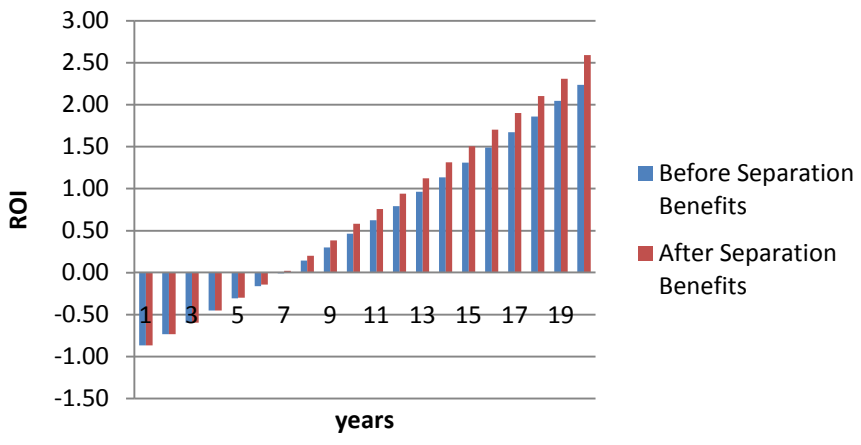


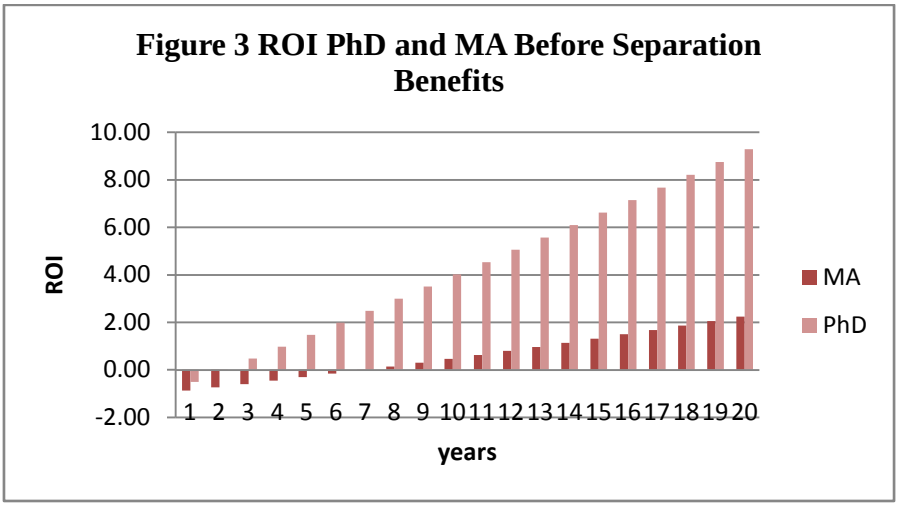
Based on the informal survey $\bar{x} - \bar{w} = 1.5$ and $\bar{C}_M = 56000$. This is the full cost of an MA from the University of Batangas.

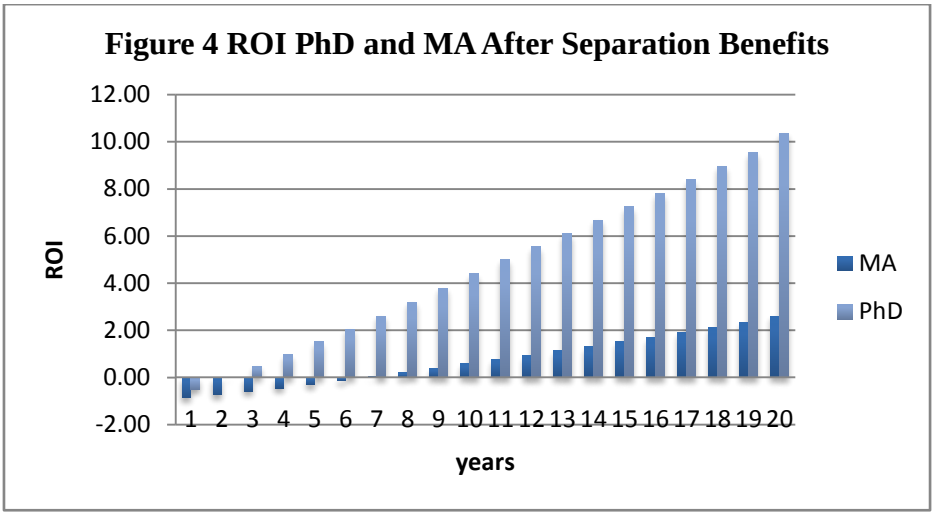
Table 1 Return on Investment (ROI) MA After *n* Years of Employment

n Years	ROI Before Separation Benefits	ROI After Separation Benefits	*n* Years	ROI Before Separation Benefits	ROI After Separation Benefits
1	-0.87	- 0.87	11	0.63	0.83
2	-0.73	- 0.73	12	0.79	1.00
3	-0.59	0.59	13	0.96	1.18
4	-0.45	0.45	14	1.14	1.35
5	-0.31	-0.31	15	1.31	1.53
6	-0.16	-0.13	16	1.49	1.72
7	-0.01	0.05	17	1.67	1.90
8	0.14	0.24	18	1.86	2.09
9	0.30	0.44	19	2.05	2.29
10	0.46	0.66	20	2.24	2.48

Figure 2 ROI MA After *n* Years of Employment







CONCLUSION

The models presented were constructed under two major assumptions: a) the yearly rate increases will behave close to the estimates produced by the regression equations and b) the teaching load scheme will remain comparable to the scheme adopted in SY 2012 – 2013.

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