

# Investment Valuation of a Graduate Diploma for Teachers Implications to Career Advancement in the Academe and Education Management

**JUAN APOLINARIO C. REYES, MS**

*Assistant Professor, Mathematics and Science Department Lyceum of the Philippines University Batangas,  
Batangas City, PHILIPPINES  
juanapolinario@gmail.com*

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**Abstract** - This is a case study on the Return on Investment (ROI) of a graduate diploma for the faculty members of the College of Education, Arts and Sciences of Lyceum of the Philippines University Batangas. The ROI model for economic valuation was based on the study done by Reyes (Reyes, 2013). This model constructed the revenue function based on per hour rate increase, semestral loading, and other incentives that come with a graduate degree. That study showed that for a Masters degree, ROI after 10 years of employment is 0.66. For a Phd it is 4.42. The present study looked into the opportunity cost of an investment in a graduate degree by obtaining the ROI of alternative investments that can be had for the same capital devoted to finish a graduate degree. These alternative investments were BPI time deposit, Meralco stocks, investment in gold, and investment in a 3 × 1 square meter cemetery plot. The performance of these alternative investments for the last 10 years was analyzed. The revenue functions were constructed using a simple linear regression model. The revenue function and the initial investment which was set equal to the total matriculation fees to finish a graduate diploma yielded the ROI for each of the alternative investments. The results are: BPI time deposit 1.31, gold 1.08, Meralco Stocks 1.16, and cemetery plot 0.33. This makes a Masters degree a less attractive investment in comparison with time deposit, Meralco stocks, and gold. But to earn a Phd is worth its time and money. A faculty can recover his investment in 2.5 years, and he stands to earn an ROI of 4.42 in a 10-year period.

**Keywords** – ROI, Graduate Diploma, Investment, Economic Valuation, Mathematical Modelling

## I. INTRODUCTION

This study looks into the Return on Investment (ROI) of a graduate diploma based on the compensation and incentive scheme of Lyceum of the Philippines University Batangas (LPU-B). Two categories of graduate diplomas were considered: Masters degree and a Phd. Masters degree covered Master of Arts and Master of Science related to the field of teaching. And Phd covered Doctor of Philosophy, Doctor of Education, Doctor of Dentistry, Doctor of Public Administration and Doctor of Business Administration.

The model for economic valuation was based on Return on Investment (ROI). Simply put it is the ratio between profit and cost. The mathematical model to obtain ROI was based on the study done by Reyes (Reyes, 2013). That study obtained the ROI of a graduate diploma for the faculty members at the College of Education, Arts and Sciences of LPU-B.

To see the opportunity cost of investing in a graduate degree, this study looked into alternative investments where a faculty member can put his money if he should choose not to finish a graduate program. These alternatives are Meralco stocks, BPI time deposit, gold, and a cemetery plot at Holy Garden Evergreen Park.

## II. METHODS

This study constructed a model for economic valuation of Meralco stocks, BPI time deposit, gold and a real estate property at Holy Garden Evergreen Park. The model was based on ROI, the ratio between profit and cost (initial investment). Define  $R$  to be the revenue function and  $C$  the cost function then  $ROI = (R - C) / C$ . The capital available for investment was the total amount of matriculation fees a faculty member is prepared to spend to finish a graduate degree. In the study done by Reyes (Reyes, 2013), the

median cost for a Masters degree was found to be 56,000Php. This is the cost of a Master of Arts degree in Education at the University of Batangas. For Phd it was found to be 75,000Php also in the same university

The revenue function was based on the revenue generated by an investment based on published data. For a BPI time deposit this was the time deposit rate. For Meralco stocks, gold, and for a cemetery plot at Holy Garden Evergreen Park this rate was based on the rate of increase per unit of investment in the last 10 years. Data on BPI time deposit rates were obtained from the listing of rates found in BPI web site. The rate of increase in valuation of Meralco stocks was based on the published prices of Meralco stocks at reuters.com. For gold it was based on the fluctuations in gold prices as published at goldpricetrends.com/Philippines. For a plot at Holy Garden Evergreen Park it was based on the price per  $3 \times 1$  square meter of a cemetery plot in 1992 and its price in 2012.

For BPI time deposit the future value of an investment  $I$ , computed as  $R = (1 + r)^t$ , provides the mathematical model to produce the revenue function. But for Meralco stocks and gold, the revenue function was estimated by a regression equation. Define  $t$  to be the number of years, and  $y$  the estimate revenue earned after  $t$  years, then the revenue function is  $y = at + b$ , where  $a$  is the increase in price per unit of an investment after  $t$  years. Normally,  $b$  represents the value of  $y$  at time  $t = 0$ . This study, however, set  $b$  to be the price per unit of investment  $y$  for the year 2013. The equation thus obtained estimated the revenue of an investment from 2013 onwards. This projection was done under the assumption that the rate of increase for the price of an investment each year shall follow the rate of increase observed in the last 10 years.

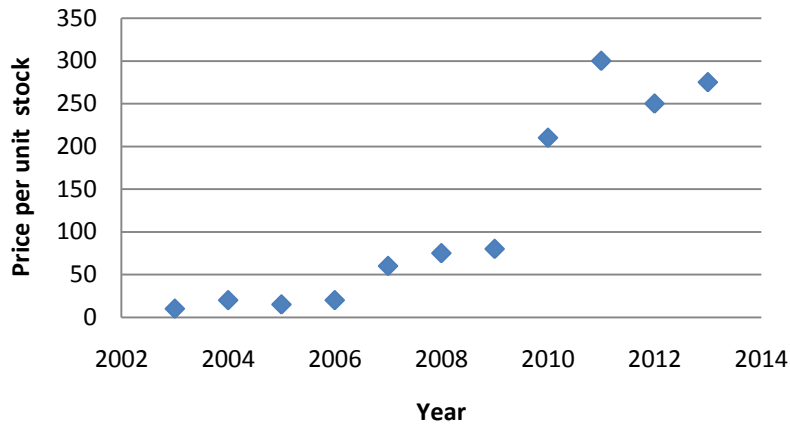


Figure 1 Meralco Stock Prices 2003 – 2013 (Source: reuters.com/finance)

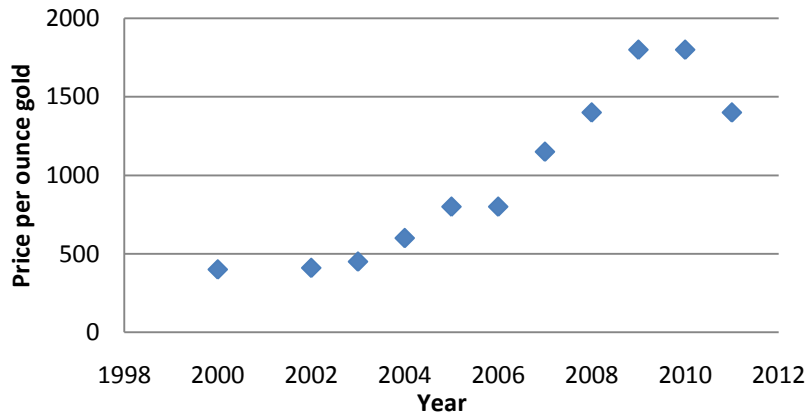


Figure 2 Gold prices 2000 – 2012 (Source: goldpricetrends.com/gold-price/Philippines)

The 10-year revenue projection for Meralco Stocks is  $y = 31.818t + 275$  and the 10-year revenue projection for investment in gold is  $y = 150.55t + 1400$ . The price per unit of stock of Meralco was 275Php in 2013. The price per ounce of gold was 1,400Php in 2013. A regression analysis on Meralco stock price and year yielded  $r^2 = 0.8451$ , for gold price and year  $r^2 = 0.8677$ .

A cemetery plot at Holy Garden Evergreen Park at San Pascual Batangas is one alternative investment available for the faculty members of CEAS, LPU-B. In 1992 the price per  $3 \times 1$  square meter of lot was 15,000Php. In 2012 it was 45,000Php. The rate of increase in lot price was approximately 1,500Php a year.

## ROI Model

The mathematical models used to obtain the ROI for Phd, MA, BPI time deposit, Meralco Stocks, gold and cemetery plot are summarized as follows:

Table 1 Return on investment models

Investment	Model
Phd (Phd, EdD, DPA, DBA, etc.)	$\frac{R_i + 4\bar{y}r_i S(i) - \bar{C}}{\bar{C}}$
MA or MS related to the field of teaching	$\frac{\tilde{R}_i + 4\tilde{x}\tilde{r}_i S(i) - \bar{C}_M}{\bar{C}_M}$
BPI Time Deposit	$(1 + r)^t - 1$
Meralco Stocks	0.1157t
Gold	0.1075t
Holy Garden Evergreen Park	0.033t

The construction of ROI model for graduate diploma was presented in "A Model for Economic Valuation of a Graduate Diploma" (Reyes, 2013). This model estimated ROI as a function of four variables: a) teaching rate per hour  $r$ , b) average teaching load a semester  $\bar{y}$ , c) length of service  $S$ , and d) the median cost of a graduate degree  $\bar{C}$ .

For BPI time deposit the model was constructed as follows. Let  $ROI = P/I$ ,  $P$  profit, and  $I$  initial investment. Then  $ROI = (1 + r)^t - 1$ . For an initial deposit of 75,000Php, the time deposit rate is 0.0875. The model to estimate ROI for Meralco stocks, gold, and a plot at Holy Garden Evergreen Park followed the same process of construction. Let  $a$  be the rate of increase in price per unit of investment a year  $t$ , and  $b$  the initial investment, then profit is  $P = at$ , and  $ROI = at/b$ . The value of  $b$  was set at the prevailing price per unit of investment in year 2013. The value of  $a$  was estimated using the data on price increases for the last 10 years.

For a  $3 \times 1$  square meter cemetery plot the ROI was computed as follows; since  $a = 1500$ Php a year and  $b = 4500$ Php, then  $P = 1500t$  and  $ROI = 0.033t$ . Table 2 presents the summary.

## Results and Discussion

Table 1 shows the projected ROI for a graduate diploma and the ROI from alternative investments. The best ROI comes from a Phd diploma and the least comes from a cemetery plot.

The graph on Figure 1 shows the opportunity cost of investing in an MA/MS. It is better than a cemetery plot but dramatically less attractive compared to BPI time deposit, Meralco stocks and gold. This leads us to question the attractiveness of pursuing an MA or MS degree and continue teaching when one can stay in the same university with possibly only an undergraduate degree, and earn a better ROI by investing it in available alternative investments. Faculty members with only undergraduate degrees are in fact occasionally employed in LPU Batangas either on a contractual or part-time basis.

Table 2. Projected ROI For a 10-year Period

Year	Phd	MA/MS	BPI	Meralco	Gold	Evergreen
1	-0.51	-0.87	0.09	0.12	0.11	0.03
2	-0.02	-0.73	0.18	0.23	0.22	0.07
3	0.49	-0.59	0.29	0.35	0.32	0.10
4	0.97	-0.45	0.40	0.46	0.43	0.13
5	1.51	-0.31	0.52	0.58	0.54	0.17
6	2.05	-0.13	0.65	0.69	0.65	0.20
7	2.59	0.05	0.80	0.81	0.75	0.23
8	3.18	0.24	0.96	0.93	0.86	0.26
9	3.79	0.44	1.13	1.04	0.97	0.30
10	4.42	0.66	1.31	1.16	1.08	0.33

On the other hand, a Phd is clearly worth its time and money. A faculty can recover his investment in two years and stands to earn 4 times his investment in 10 years.

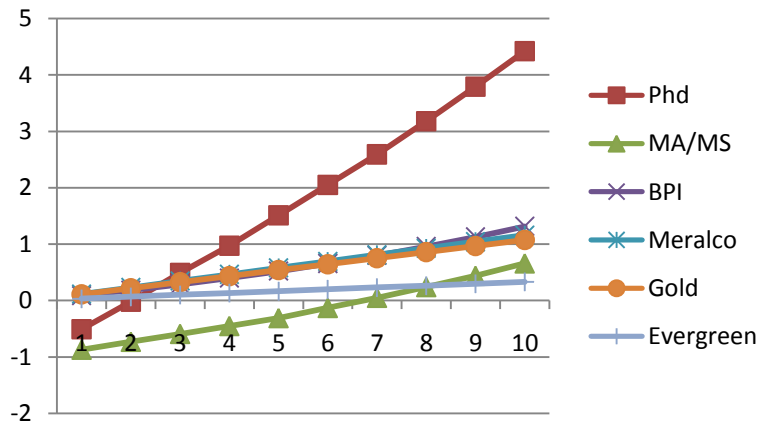


Figure 3 Comparative return on investment

It has to be pointed out the ROI of a graduate diploma as estimated in the model developed by Reyes is likely to be overstated and therefore, an MA/MS degree becomes even less attractive. The cost function of that model rested mainly on full matriculation fees. It did not include additional expenses that went along with writing and defending a thesis for a Masters degree, and a dissertation for Phd.

Before this paper stirs beehives, the following limitations and assumptions have to be repeated. First, this is a case study and naturally it reflects the salary scheme of LPU-B which is a private university. Second, the projections on ROI for alternative investments rest on the assumption that the price per

unit of each investment will increase at the same rate per year as it has for the last 10 years.

Having this in mind, it is still not indefensible to connect the ROI of MA/MS in LPU-B to what an MA/MS might earn in other universities especially in the universities in Batangas province. Faculty members of LPU-B probably earn more per hour as teaching professionals owing partly to the high matriculation fees for courses offered in LPU-B. LPU-B also adopts a competitive salary scheme. If ever the ROI of an MA/MS seemed unattractive in LPU-B, it does not follow it would receive a better ROI in other private universities, at least in the province of Batangas.

### Implications to Career Advancement

Members of LPU Faculty must study the system of classification and promotion in LPU Batangas. To earn units in a graduate degree without the intention of finishing that degree may not be the best strategy to follow if one aims to improve academic rank. To go to graduate school cost money, but that money can be used instead to pay for membership in professional organizations, attendance in seminars, presentations of research papers, and publication of papers in international journals. These alternatives could be a more cost effective strategy to pursue in relation to rank advancement.

Although faculty members keep a copy of LPU-B Employee's Manual, they know little of the financial gain that goes with each point in the ranking system. This is because the manual does not publish the corresponding increase in pay rate per point-improvement in rank. There are company confidentiality issues to consider of course, but still faculty members should not be left totally clueless about pay rate increases in relation to every point earned in the ranking system. The human resource department can produce a monetization of points in the ranking system. With this monetization, faculty members can see the profits that accrue to them with every point-improvement in academic rank.

Faculty members must also consider obtaining their graduate diplomas from state universities and colleges because graduate programs from these institutions are, in general, less expensive than those offered in private schools and colleges.

### Implications to Education Management

Managers of educational institutions have the responsibility to sustain the financial soundness of private universities and colleges, but they too must attend to the cost issues of obtaining a graduate diploma. The low ROI of an MA or MS degree can discourage teaching professionals from pursuing one. But the cost of an MA, MS or Phd can still be reduced if managers will remove unnecessary expensive practices that had been part of culture in graduate schools. One point of concern is the practice of gift-giving and extravagant feasts organized during thesis and dissertation proposal and defense. Because this is part of culture, few people call attention to the huge expense students make to follow this practice. It is not uncommon to hear that students spend something equivalent to their full matriculation just to hire a food caterer.

The implication of a low ROI for an MA/MS degree cannot be understated especially in light of the major shift in employment in the school system due to K+12. In 2016, teachers will leave universities en masse and seek employment elsewhere. It is reasonable to project many of them will seek employment and shall be employed in senior high schools. When normal operations return to universities in 2018, school managers will face the possibility that few of their former teachers will come back. This is because their graduate diploma could earn them a better ROI in senior high schools that it could in higher education.

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