

Pay-back for Ph Ds

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It is well known that one loses financially over the long term if one chooses to pursue higher academic degrees and then join the teaching or scientific profession. However, what is less widely accepted is that even within the academic or scientific profession, it may be unwise to start a career only after one has a Ph D. The present mathematical model demonstrates with statistical data from one academic establishment that in terms of financial (net-worth) returns in the long term, it is better not to take a Ph D, given the incentives (or lack of it) currently prevailing in the academic sector in India.

Some preliminaries

Young men and women in this country now do not choose to enter the academic or scientific profession. For example, a young engineer, who immediately after graduation, is persuaded to join the teaching profession at the entry level, i.e. as a lecturer in Kerala will earn about Rs 13,000 per month. Her counterpart, who joins the industry will earn between Rs 20,000 and 40,000 per month. And this differential would only continue long into one's career, making it extremely unattractive for anyone to join the teaching or research profession.

Another dilemma facing one who joins the teaching profession, is whether it is worth pursuing a Ph D, especially if it is worth doing a Ph D in one continuous stint after her first degree. It is believed that this will in the long term confer financial benefits. That is, that there is definitely a pay-back, especially to those who choose to remain in the academic profession, to start a career with a Ph D.

Recently, I was fortunate to gain access to data from a well-known centre of learning, the Cochin University of Science and Technology (CUSAT) in Kerala. Arguably, it is among the leading research universities in this part of the world – a faculty that is about 300 strong, publishing nearly 300 refereed papers a year and producing about 80–100 PhDs a year. Selections and promotions are scrupulously guided by UGC and AICTE guidelines so that only one who has a Ph D can gain promotion to the ranks of Reader (i.e. Assistant Professor) and Professor. However, it allows those with lower degrees (B Tech/BE and MSc) to join as Lecturers and be promoted to the ranks of Lecturer (Senior Scale) and Lecturer (Selection Grade). This will mean a saturation in emoluments at around the age of 40–45, while those with a Ph D can continue to

rise further. However, joining only after acquiring a Ph D will mean postponing the stage at which one earns a fair salary and a consequent financial loss at the early years of one's life. So, what is the long-term benefit of such a strategy?

The present mathematical model demonstrates with live statistical data from CUSAT, that in terms of financial (net-worth) returns in the long term, it is better not to take a Ph D, given the incentives (or lack of it) currently prevailing in the academic sector in India.

The scatter diagram statistics and cash-flow calculations

Data were obtained from the CUSAT records regarding 276 of its permanent faculty. Among them, 153 had PhDs, and ranged in age from 36 to 60 years. There were 123 faculty without PhDs, and this group ranged in age from 30 to 60 years. At a first glance, this is an indication that

those without PhDs have an advantage in joining service (roughly translating on a statistical basis to 6 years), and consequently, a head-start in accumulating net-worth. Also, the basic pay (BP) fixed for each faculty member was available. It is assumed that the other allowances do not vary so much with the Ph D/non-Ph D issue, and therefore, the difference in BP was taken as the quantity that determines the differential earning capacity at different stages of one's professional career graph.

The data were then plotted in the form of an X–Y scatter diagram. Figure 1 shows how the BP of the Ph D and non-Ph D groups cluster in different ways. Trend-lines were also computed which revealed clearly that for faculty members under 41 years, the non-PhDs have a noticeable early financial advantage over the PhDs. If fact, as a statistical average, only after the age of 42 does a Ph D start earning more than her non-Ph D counterpart. If it is assumed that this early financial

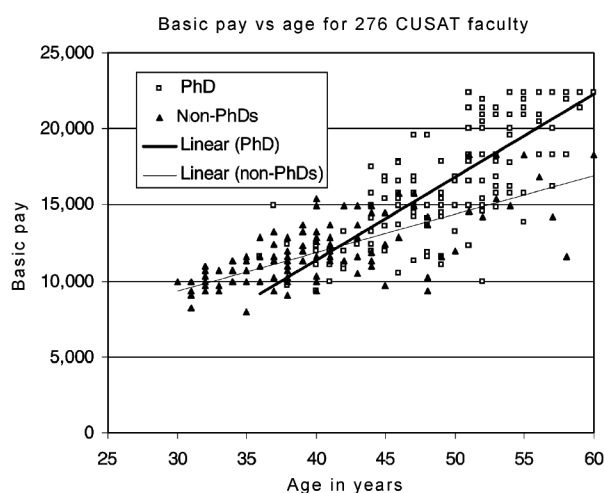


Figure 1. X–Y scatter diagram showing how the basic pay of the Ph D and non-Ph D groups cluster in different ways. Trend-lines are also computed which reveal clearly that for faculty members under 41 years of age, the non-PhDs have a noticeable financial advantage over the PhDs.

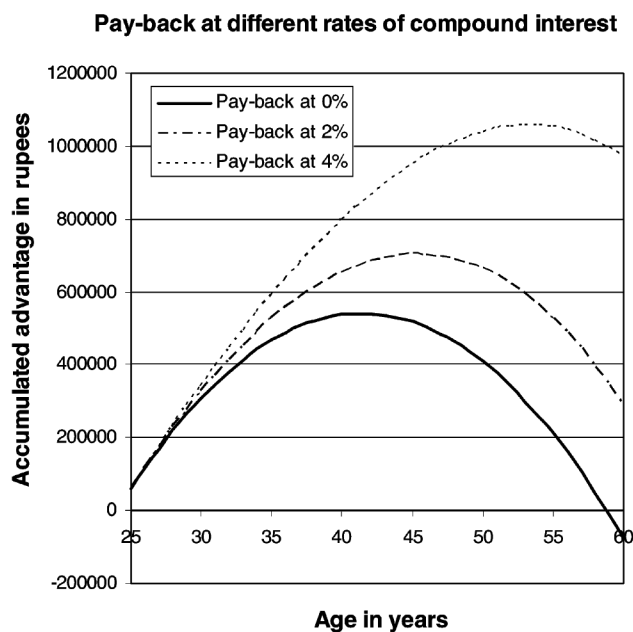


Figure 2. Investment of the difference in basic pay between a Ph D and a non-Ph D accumulates as net-worth to the individual. In the long term, a Ph D will never be able to recoup the opportunity she has lost in the early part of her career.

advantage is invested in a reasonably safe instrument, then in the long term, a Ph D will never be able to recoup the opportunity she has lost in the early part of her career.

To continue the analysis, the linear trend-lines can be described by the formulae:

$$\begin{aligned} \text{BP (Ph D)} &= -10658.41 + 549.17 * (\text{age}), \\ \text{BP (non-Ph D)} &= 1809.52 + 251.67 * (\text{age}). \end{aligned}$$

The monthly financial advantage (or disadvantage) is then taken as being invested annually in a secure financial instrument which gives compound interest at a specified rate. The data above imply that on an average, at age 25 years, non-PhDs start with a Rs 5030 per month advantage, which is then neutralized by age 42. Fig-

ure 2 shows how the investment of the difference in BP between a Ph D and a non-Ph D accumulates as net-worth to the individual. As mentioned earlier, in the long term, a Ph D will never be able to recoup the opportunity she has lost in the early part of her career. At 4% compound interest, just by investing only the differential in BP (note, allowances are ignored in this calculation), a non-Ph D is better-off by a million rupees!

Note that the projections are restricted to the age of 60 years, i.e. the current age of retirement. The post-retirement pensionary benefits which are a function of the last pay drawn at the time of retirement have not been factored in, and considering the current average life-expectancy, this could mean a substantial post-retirement income (fairly well comparable with

an employee's entire earnings during her service period). Discounting this, the bottom line is, 'it does not pay to do a Ph D!'.

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