We are investigating the returns to total income with regards to attaining a Ph.D. Specifically, we are analyzing the returns to a doctorate in Economics. Literature has shown that specialized degrees lead to a significant pay off over the course of your career. Economics has been found to have one of the highest significant payoff over the course of your career. Returns to Higher Education education does pay off for students regardless of the degree fields (CEW 2015).

Literature Review

Making College Worth It: A Review of Research on the Returns to Higher Education (Oreopoulos, Petronijevic 2013) determines that the investment to higher education does pay off for students regardless of the heterogeneity of college majors. However, college graduation rates have been on the decline despite the increasing earnings premium to higher education. Investment in graduate education (Weiss 1971) also supports this notion but furthers the analysis by concluding that a Ph.D. in Economics or Mathematics Ph.D yields higher returns than average. Economics: Good Choice of Major for Future CEO’s (Flyn, Quinn 2006) upholds the validity of the assumption that majoring in Economics is appropriate for aspiring CEO’s. Economics majors placed third in the highest likelihood of becoming a S&P500 CEO. African Americans, Asians and Hispanics earn significantly less when compared to white colleagues. Comparing the returns to a Ph.D. in Econ vs Sociology or Physics, physics yields the highest returns in compensated salary in comparison to an individual with a bachelor’s degree (yielding a 60% return). Economics yields the second highest return at 46%. A master’s degree and a Ph.D. in Economics increases the probability of securing a high income position by 11.94% and 14.44% respectively. Overall, across all three of the degree fields, there is a significantly greater probability of attaining a high income salary with either a master’s or Ph.D. in their respective field.

Research Question

Does attaining a Ph.D. in Economics yield a significant increase to income when compared to solely earning a Bachelor’s degree?

Hypothesis

• Attaining a doctoral degree in Economics yields a higher return in terms of compensation in comparison than solely attaining a bachelor’s.
• Attaining a Ph.D. in Economics yields higher returns than Physics or Sociology.
• With a Ph.D. in Economics, you have a increased probability of attaining a high salary position in comparison to a bachelor’s degree in Economics.

Methodology

• Primary: Mincer’s earning function in regards to income returns to education.
• Secondary: Comparing interdisciplinary fields utilizing Mincer’s earning function to gauge returns
• Tertiary: Multinomial LOGIT model to examine the probability of attaining a high income position.

Descriptive Statistics

OLS Model: Mincer’s Earning Function

$$\ln(inc) = \beta_0 + \beta_1 \text{DegField} + \beta_2 \text{Masters} + \beta_3 \text{PhD} + \delta_1 + \epsilon$$

Multinomial Logit Model

$$\ln\text{Cat} = \beta_0 + \beta_1 \text{DegField} + \beta_2 \text{Masters} + \beta_3 \text{PhD} + \delta_1 + \epsilon$$

Empirical Results

<table>
<thead>
<tr>
<th>Income Category</th>
<th>Bachelor’s Degree</th>
<th>Master’s Degree</th>
<th>PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (inc&lt;$25000)</td>
<td>0.06**</td>
<td>0.07**</td>
<td>0.10**</td>
</tr>
<tr>
<td>Medium (25000&lt;inc&lt;75000)</td>
<td>0.09**</td>
<td>0.11**</td>
<td>0.13**</td>
</tr>
<tr>
<td>High (inc&gt;$75000)</td>
<td>0.12**</td>
<td>0.14**</td>
<td>0.16**</td>
</tr>
</tbody>
</table>

Marginal Effects of Probability of Getting Employment in a High-Paying Position by Field

$$\ln(inc) = \beta_0 + \beta_1 \text{DegField} + \beta_2 \text{Masters} + \beta_3 \text{PhD} + \delta_1 + \epsilon$$

Diagnostics

<table>
<thead>
<tr>
<th>Diagnostic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-statistic</td>
<td>13.22</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Conclusion

Comparing earnings of those with a Ph.D. in Econ to those with a bachelor’s degree in Econ, Ph.D. holders earn approximately 46.4% more than bachelor’s holders. Within the economics profession, there is a significant wage gap in regards to gender and race. Women with a bachelor’s in economics earn 35% less than men with a bachelor’s degree on average.

References


Brand, Jennie E and Xie, Yu. Who benefits most from college? Evidence for negative selection in heterogeneous income salary with either a master’s or Ph.D. in their respective field.