Relative productivity drivers of economists: A probit/logit approach for six European countries

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Introduction

Economists talk frequently about productivity. They refer to productivity of the economy in most of the cases. This paper examines the productivity of the economists themselves. There has been an increase interest on the drivers of productivity among scientists and economists in particular. Among them the country of the PhD studies, gender, north vs south and inbreeding (at the departmental or national level) has been suggested. Most of the studies employ absolute measures of productivity. We deviate from this tradition and examine relative productivity. Relative is defined in terms of deviations from the countries mean productivity. The latter is measured as papers per faculty (per year) and citations per faculty (per year). We employ a dataset that consists of 1431 economists from six countries. The north is represented by Belgium, Denmark and Germany whereas the south by Greece, Italy and Portugal[1].

Literature Review

The literature on the factors that affect an economists' productivity has expanded in the last decade. Çokgezen (2006) examined the productivity differentials for economists based in Turkey between private and state universities. Ben-David (2010) considered the case of Israel and how high and low rank academic positions vary with productivity. Katranidis et al (2012) examined differences in academic performance taken into account the country where the doctoral studies have been completed for Portugal and Greece respectively. Using survey data, Kalaitzidakis et al. (2004) provided evidence that European economics departments with links with institutions in North-America are more productive in terms of research output. More recently, Bauwens et al. (2011) stressed that English proficiency is an important factor for higher productivity amongst economists.

Data

Our dataset stems from the Scopus database and from the websites of the corresponding Departments. The data were collected for 1431 economists that were employed in Belgium (125

economists), Denmark (82), Germany (543), Greece (82), Italy (504) and Portugal (95). The number of observations (economists) for each country reflects 25% of the RePec registered economists in each country. The characteristics considered for each economist includes number of papers, number of citations, whether their PhD studies took place in the US or they country they work (inbreeding at the national level), gender and the real research age (number of years since obtaining their PhD).

This paper is trying to advance the relative literature in two ways: We use relative measures of productivity on comparing economists' productivity in more than one country instead of absolute measures of productivity, i.e. papers per faculty per year or citations per faculty per year. More specifically, relative productive is calculated as the difference between a researcher's and the country's average productivity. Researchers get a value of 1 if they exhibit a positive difference in productivity compared to the country's average and 0 otherwise. In this sense, the dependent variable is binary and thus probit and logit models are employed to investigate the drivers of relative productivity among economists in six EU countries. This also represents advancement in the literature since OLS regressions were used to model average response to specific characteristics.

The second is the academic inbreeding that refers to the practice where Universities hire its PhD graduates. The evidence demonstrates that this affects negatively the scholarly output (Inanc & Tuncer, 2011). In this study we will consider inbreeding at a higher level i.e. at the national level. Scientific human capital would, in this respect, reflect the quality of human and social capital in the country. Goudard and Lubrano (2013) introduced a model where social capital complements scientific human capital. We will examine whether hiring economists that hold PhD from the same country affects relative productivity. We will refer to this characteristic as national inbreeding.

Methodology

As noted in the previous section, the goal of this study is to investigate the drivers of relative productivity. The dependent variable takes the value of 0 if the productivity of the researcher is below the country's average and 1 otherwise.

A linear probability model (LPM) is used in the form of:

$$P_i=p(y_i=1)=\beta_1+\beta_2(Belgium*PhD^{US})+\beta_3(Denmark*PhD^{US})+\beta_4(Germany*PhD^{US})+\beta_5(Greece*PhD^{US})+\beta_6(Italy*PhD^{US})+\beta_7(Portugal*PhD^{US})+\beta_8(Belgium*PhD^{Belgium})+\beta_9(Denmark*PhD^{Denmark})+\beta_{10}(Germany*PhD^{Germany})+\beta_{11}(Greece*PhD^{Greece})+\beta_{12}(Italy*PhD^{Italy})+\beta_{13}(Portugal*PhD^{Portugal})+\beta_{14}(Belgium*Female)+\beta_{15}(Denmark*Female)+\beta_{16}(Germany*Female)+\beta_{17}(Greece*Female)+\beta_{18}(Italy*PhD^{Italy})+\beta_{19}(Portugal*Female) \quad (1)$$

where y_i is 1 if the difference between papers (citations) per faculty per year and the country's average is positive and 0 otherwise, *Belgium ,…, Portugal* are dummy variables denoting the country a research is based, PhD^{US} and $PhD^{Belgium}$ are dummy variables taking the value of 1 if the researcher has completed her/his PhD studies in the US and Belgium, while *female* is a gender dummy taking the value of 1 if the research is female.

Results

Equation 1 is estimated for two relative measures of productivity. We consider above country average papers per faculty per year and citations per faculty per year. In the probit model, the factors that affect in a negative and significant way relative productivity (at the 90% significance level) are: (i) having a US PhD and work in Germany, (ii) a German PhD and work in Germany (national level inbreeding), (iii) a Greek PhD and work in Greece, (iv) Italian PhD and work in Italy, (v) Portuguese PhD and work in Portugal and (vi) being female in Germany, Denmark and Italy.

In the logistic model these factors are (negative and significant at the 90%): (i) having a US PhD and work in Germany or in Denmark, (ii) a German PhD and work in Germany (national level inbreeding), (iv) a Danish PhD and work in Denmark, (v) an Italian PhD and work in Italy and (vi) being female in Germany, Greece, Italy and Portugal.

The only variable that affects citations per faculty per year in a positive way is holding a US PhD and working in Italy. Variables that affect in a negative and significant way (90%) are: (i) a German PhD and work in Germany, (ii) a Greek PhD and work in Greece, (iii) an Italian PhD and work in Italy, (iv) a Portuguese PhD and work in Portugal and (vi) being female in Belgium, Germany, Denmark and Italy. The results are similar in the case of the logistic function: (i) a PhD from Belgium and work there, (ii) German PhD and work in Germany, (iii) a Danish PhD and work in Denmark, and (iv) being female in Germany, Greece, Italy and Portugal.

Overall the highest marginal effects are observed for the above average papers per faculty per year: (i) being female in Denmark (-0.502), (ii) holding a

Greek PhD in Greece (-0.410) and (iii) holding a Portuguese PhD in Portugal (-0.331) (in the probit model). For the logit: (i) holding a Danish PhD in Denmark (-0.585), (ii) being female in Greece (-0.423) and (iii) holding a US PhD in Denmark. For the citations (probit), the largest marginal effects are identified for being female in Belgium and Denmark (-0.311 and -0.252 respectively). In the logit, inbreeding in Belgium and Denmark (-0.337 and -0.257).

Conclusions

This study examines the drivers of relative productivity among 1431 economists from six European countries. Scopus database was the data source for economists based in three northern EU countries (Belgium, Denmark and Germany) and three southern (Greece, Italy and Portugal). We identify the drivers of relative productivity in terms of deviations from the national average in papers per faculty per year and citations per faculty per year. We employ probit and logit models given that the dependent variable is binary (above the national average 1, below 0). For papers the most important variables that were affecting relative productivity in a negative manner were gender in Denmark and national inbreeding in Greece and Portugal; while for the citations, gender and national inbreeding in Belgium.

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