

Thesis Abstract

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“Heterogeneous Skill Growth across College Majors” *Job Market Paper*

There is a large literature on differential wage returns across college majors, but not many papers focus on skill growth by major. Differences in course taking by major will result in students accumulating different types and amounts of skills and the heterogeneous skill growth will lead to the differences in wage returns. This paper estimates skill growth during college by college major using the NLSY97 and the O*NET. To capture both type and quantity of accumulated skills, I assume that each major produces a general cognitive skill and a major-specific skill. I further allow individual heterogeneity in skill growth. I take a task-based approach and use occupation choice to estimate skill growth in general cognitive skill. To deal with noisy skill measurements and endogeneity, a dynamic factor model is constructed. The results show substantial growth of general cognitive skill in all majors, but with large differences in average growth across majors. I find different effects of pre-college skill levels on the skill growth by major, but the differences are not large enough to explain an observed strong sorting into major based on pre-college skill. The contribution of major-specific skill growth to wage growth is small compared to that of general cognitive skill growth in any major.

“Basic Skills or Major-Specific Knowledge? Sources of Wage Penalties for Working Outside the Major Field of Study”

This paper examines the source of wage penalties for working outside one’s major field of study. Recent research shows that workers in a job unrelated to their major field of study experience significantly lower wages than those in a related job. A substantial amount of human capital may be underutilized. Identifying the sources of the wage penalty is important for understanding how to decrease the inefficient use of human capital, how students should choose a college major, and what type of human capital students accumulate in college. I use the 1993 National Survey of College Graduates and the O*NET to divide the sources into basic skills and major-specific knowledge. The results show that, on average, individual characteristics explain more than half of the raw wage penalty and that 28% - 41% of the remained wage penalty can come from the mismatch in underlying basic skills. There are wide variations across degree types and fields of study.

“Job Relatedness to College Major: Workers’ Self-Assessment Measures and Job Analysis Measures”

Many papers argue that the quality of the match between college major and job has sizable effects on wages. However, it is difficult to measure match quality, and there are several suggested approaches. Using the National Survey of College Graduates 1993, I examine the relationship between a worker’s self-assessment measure, a job analysis measure constructed from the O*NET, and a job analysis measure constructed from the Standard Occupation Classification (SOC) system. I also examine how much the wage penalties of working in unrelated jobs vary with the relatedness measures.