Forming wage expectations through learning: Evidence from college major choices ☆

Xiaoyu Xia

Cheng Yu Tung Building 901, Chinese University of Hong Kong, 12 Chak Cheung Street, Hong Kong

ARTICLE INFO

ABSTRACT

How do college students choose their majors, and what role does the family play in their choices? I use data from two major longitudinal surveys to develop and estimate a model in which students learn about earning opportunities associated with different majors through the wages of older siblings and parents. The probability of a student choosing a major that corresponds to the occupation of a family member is strongly correlated with the family member's wage at the time the major choice is made. This correlation remains strong after controlling for family-correlated abilities or preferences, and additional empirical evidence suggests that the observed correlation arises through a family-based wage information channel.

© 2016 Elsevier B.V. All rights reserved.

1. Introduction

Young people must often make important decisions – such as which college to attend or which job to take – in the presence of substantial uncertainty over the future consequences of their choices. How do they form expectations about the payoffs of different options? A long line of social science research, dating from at least a study by Hyman (1942), argues that people learn from the choices and outcomes of "reference groups."[1] Perhaps the most important reference group for many decisions is the family.[2] There are strong family correlations in many socioeconomic outcomes (see a study by Black and Devereux (2011) for a recent survey), including occupational status. However, whether this correlation arises though learning opportunities or other potential channels such as correlated abilities or tastes remains unclear.

---

[1] A survey conducted in the Dominican Republic by Jensen (2010) provides a recent example in the economics field. His data show that students' main source of earnings information is the people they know in their community.

[2] Studies conducted across social science fields such as those by Weast (1956), Bank et al. (1990), Manski (1993), Brody (1998), Duncan et al. (2001) document the broad ranging influence of family members on youth behavior.

There has been growing research interest in the mechanisms through which parents shape children's human capital investment and career decisions. Shared family abilities and tastes explain why students' educational attainment strongly correlates with that of their family members. For example, Bjorklund et al. (2006) find that biological parents' education is an important determinant for a randomly assigned adoptee's schooling outcomes, proving the influence of a biological link. In addition, family members may share financial resources. Hilger (2014) finds that parental layoffs reduce children's college enrolment, college quality, and early career earnings. This paper proposes and tests an alternative mechanism that focuses on information sharing to capture how family members' labor market outcomes affect students' educational choices.

In this study, I use data from two major longitudinal surveys to directly examine the role of learning based on the labor market experiences of close family members (older siblings and parents) in students' choice of college major. Choosing a major is an important first step in the careers of many college students and a significant determinant of their subsequent earnings and occupational status (Arcidiacono, 2004; Hamermesh and Donald, 2008; Joseph et al., 2012). Although human capital theory (Becker, 1962) directly assumes that young people choose their future careers by calculating the internal rate of return for each choice, this paper takes a step back and explores how young people develop their expectations of the returns on education.

Simple reduced-form models show that a college student is more likely to choose a major associated with the occupation of a family member who earns a higher wage, especially when the family member earns a high wage at the time the student chooses her major. To explain this sensitivity to timing, I add a learning component to the conventional major-choice model to test whether incorporating family-based information improves the model fit relative to a benchmark "rational expectations" model.[3] My structural estimates confirm that a student places significant weight on wage information based on the contemporaneous wages of close family members.

My main data source is the National Longitudinal Survey of Youth 1979 (NLSY79). It includes a relatively large number of sibling pairs, allowing me to link younger siblings' choices of college major with their older siblings' earnings. I use an additional data set, the National Education Longitudinal Study of 1988 (NELS88), to link students' major choices to changes in parental income.

I begin by establishing the importance of family-based labor market information flows using a reduced-form model of the probability that a student will make a major choice that corresponds to the occupation of an older sibling or parent. A student is more likely to pursue a major that is related to the occupation of a family member when the family member earns a high wage during the student's time in high school or college. There is no such correlation between a student's major choice and the wages of siblings or parents in later years. The marginal elasticity of a student's choice of major with respect to a family member's earnings after controlling for the occupational average is 0.2, and previous estimates of the choice elasticity with respect to the occupational average wage is around 0.1 (e.g., Beffy et al., 2012; Wiswall and Zafar, 2015). The comparison suggests that a student is sensitive to perceptions of earnings opportunities based on the labor market experience of close family members.

To rule out some competing explanations, I examine the correlation of students' choice of major with family members' labor market experience using different control variables. For example, this correlation does not depend on factors such as family business or sibling-shared college major preferences, but does depend on the timing of a family member's labor market outcomes. Moreover, students choose majors corresponding to not only a family member's wage outcomes but also unemployment duration and job satisfaction. These responses are orthogonal to the trajectory of average occupational wage. These reduced-form results appear consistent with the hypothesis that students choose majors based on the predictive power of family members' earnings rather than family-correlated abilities or direct help from family ties.

To understand the role of family information in student career planning, I develop a nested multinomial logit model of major choices, in which students update their expected earnings in response to their family members' wage outcomes. They interpret a family member's wage relative to the occupational average as a signal of family-specific matching quality. A student believes that the future wages associated with a given major can be decomposed into two components: a predictable wage component that is known prior to beginning work and an unknown wage component. To form a belief about the unknown component, students rely on the realized wages of a family member working in an occupation related to the major under consideration.

The effect of family wage outcomes on students' major choices indicates the extent to which the students learn from family-based information. My point estimate for the weight students place on their family members' wages when they update their future earnings expectations is 0.39. However, the empirical wage correlation between siblings in the NLSY79 is around 0.1, lower than my point estimate of the students' perceived correlation. This comparison suggests that students may overestimate the correlation of wage outcomes between close family members.

This paper calls attention to an information channel in how family background affects students' educational decisions. Students' reliance on parental earnings to learn about the returns on education is one causal mechanism that explains

---

[3] Assuming that students have rational expectations that are equal to the realized occupational average wage conditional on observables is a common approach taken by previous studies into choices in college majors, such as those by Siow (1984), Berger (1988), Keane and Wolpin (1997), Ryoo and Rosen (2004).