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When everyone goes to college: The causal effect of college expansion on earnings



Seongsoo Choi*

Department of Sociology, Yale University, 493 College Street, New Haven, CT 06511-8933, USA

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ABSTRACT

In this study, we estimate the causal effect of college expansion on earnings using the example of South Korea in the 1990s where the college enrollment rate increased from just over thirty percent to over eighty percent over a fifteen years period. We compare the pre-expansion cohort and the post-expansion cohort in order to identify those who would attend college because of the expansion but would not attend otherwise (compliers). We, then, estimate compliers' earnings gain from the college expansion relative to the earnings changes of two control groups: those who either would or would not go to college regardless of college expansion (always-takers and never-takers). We find a striking gendered pattern; for men, the earnings return to college expansion is moderate and mostly driven by the increasing skill price, whereas, for women, the return is significantly large even net of the skill price change.

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1. Introduction

In most modern societies, completing more education results in increased earnings for individuals (Psacharopoulos and Patrinos, 2004). However, matters are less clear at the aggregate level. Does expanding access to higher education have economic benefits for those who can now attend college thanks to the expansion in the same way as an individual's additional investment in higher education does? Does an increased share of college graduates improve the earnings of new college graduates and their relative positions compared to traditional college graduates? Would this be true even in the case where an expansion makes college attenders the majority in a cohort, making higher education close to universal?

Answering these questions is important both theoretically and for policy. A mass expansion of education is not a simple sum of individual decisions for more educational investment but rather the transformation of institutions (Shavit et al., 2007). Thus, the consequences of educational expansion, as a newly emerging or modified social structure, demonstrate how a joint behavior at a collective level cannot be reduced to a simple collection of individual behaviors. In this way, the question about the social and economic rewards of educational expansion touches a core theme of sociology: the dynamic process of how individuals behaving at micro-levels influence and are influenced by macro-level phenomena. Furthermore, these questions have direct implications for policies aimed at expanding access to higher education. For example, President Obama proposed to make the United States the world leader in college graduation rates by 2020.¹ Evaluating this kind of policy needs empirical evidence for the answers to the questions posed above.

* Fax: +1 203 432 6976.

E-mail address: seongsoo.choi@yale.edu

¹ "Topping College Graduate Rates, Is It Worth It?" National Public Radio, January 29, 2013, available at <http://www.npr.org/2013/01/29/170563090/topping-college-graduate-rates-is-it-worth-it>.

A crucial issue is that educational expansion is not applied to the entire population; only a group of individuals respond to or comply with expanded access to education. There are people who do not change their behaviors either because they would go to college anyway or because they would not attend regardless of a change in policy. Although many previous studies examine the societal-wide impact of educational expansion from various perspectives (Breen, 2010; Hannum and Buchmann, 2005; Lange and Topel, 2006; Shavit et al., 2007), the primary criterion that should be considered when evaluating the policies of educational expansion is how they impact their compliers. Distinguishing those who would comply with college expansion from the entire cohort of high school graduates is a challenging task methodologically because it requires us to think counterfactually. Researchers have tackled this issue directly or indirectly by adopting various research designs and methodological models. Some utilize varying propensities for college in a single cohort and infer whether expansion policies will be effective (e.g., Brand and Xie, 2010; Carneiro et al., 2011). Others more directly compare cohorts that are exposed differently to expansion (e.g., Devereux and Fan, 2011; Maurin and McNally, 2008), mainly capitalizing on the exogenous feature of the cohort membership as an instrumental variable (IV) and identifying compliers with the local average treatment effect (LATE) framework (Imbens and Angrist, 1994).

In this paper, we examine a unique empirical case that offers an ideal setting for estimating the causal effect of educational expansion on earnings: the dramatic growth of college education in South Korea, where the college enrollment rate more than doubled from 30% to 80% during the 1990s. The South Korean college expansion offers a rare example because the expansion policy changed the status of college attenders from the minority to the majority within a short period of time. Adopting a counterfactual causal framework (Morgan and Winship, 2007), we identify a pre-expansion cohort and a post-expansion cohort and then estimate the change in earnings due to expansion for three groups: “always-takers” (who would be predicted to go to college before and after expansion), “compliers” (who would not have attended before the expansion but would do so after the expansion), and “never-takers” (who would not go to college in either period). Because the expansion only affected the educational outcomes of compliers, comparing the change in earnings for this group to the changes for always-takers and never-takers allows us to infer the effect of expansion on earnings.

2. Previous literature

2.1. College premium and expansion as increasing skill supply

The mainstream explanation in economics about the role of educational expansion in the process of wage or earnings determination is the supply-demand model. In this framework, the increasing supply of skilled workers that occurs with educational expansion, along with the demand for skilled labor, determines the level of earnings. It is well documented that the temporal dynamics of the earnings returns to education over the last century in the US are largely explained by this supply and demand mechanism (Card and Lemieux, 2001; Goldin and Katz, 2008; Katz and Murphy, 1992). For example, the so-called college wage premium rose sharply in the US from the 1980s up to its record high level in the mid-2000s (Goldin and Katz, 2008). Considering a secular increase in demand factors (largely, skill-biased technological change, or SBTC), the widening earnings gap between college graduates and non-graduates can be attributed to a stagnated supply of college graduates (Goldin and Katz, 2008). The title of Goldin and Katz's (2008) book *The Race between Education and Technology* aptly summarizes this history.

The supply and demand framework has also been applied to other countries (e.g., Harmon et al., 2003; Walker and Zhu, 2008 for the UK and Gebel and Pfeiffer, 2010 for Germany) including South Korea. In South Korea, the increase in college-educated labor in the 1980s drove a slight decline in the college premium, but during the 1990s, when college education expanded dramatically, the college premium started to rise thanks to a greater demand for high-skilled labor (Choi and Jeong, 2005; Choi, 1996; Choi et al., 2005).

This body of research only offers limited implications for examining the causal effect of educational expansion, however. A change in the college premium alone reveals little about whether expanded educational opportunities benefit those who attended college *because of* the expansion. An increased college earnings premium following educational expansion could be driven by increased earnings for those “compliers” who would not have attended before expansion. Yet the premium increase could also result from a change in the premium for the “always-takers”, those who would also have attended even before expansion; the always-takers may lose their premium because of the increasing supply of college graduates (compliers) and also may earn more because of a shift in demand for skilled workers in the labor market.

Such heterogeneity among college graduates addresses two important issues that need to be considered when examining the effect of college expansion. First, making claims about the causal effects of expansion requires distinguishing the returns of always-takers (who consistently have higher propensities for college) from the returns of compliers (whose lower propensities for college fall below the threshold for enrollment in the pre-expansion period but above it in the post-expansion period). Second, it is necessary to compare the returns of compliers with those of always-takers in order to control for any changes in the labor market that are induced by the dynamics of supply and demand in college-educated labor.

2.2. Heterogeneous earnings returns to college education and expansion policy

Empirical studies of the heterogeneous returns to college show mixed results (Hout, 2012). For example, Brand and Xie (2010), using data from the National Longitudinal Study of Youth 1979 (NLSY79) and the Wisconsin Longitudinal Study, find

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