



Canadian Labour Market and Skills Researcher Network

Working Paper No. 2

The Changing Role of Family Income and Ability in Determining Educational Achievement

Philippe Belley
University of Western Ontario

Lance Lochner
University of Western Ontario
NBER

December 2008

CLSRN is supported by Human Resources and Social Development Canada (HRSDC) and the Social Sciences and Humanities Research Council of Canada (SSHRC). All opinions are those of the authors and do not reflect the views of HRSDC or the SSHRC.

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Philippe Belley
University of Western Ontario

Lance Lochner
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Abstract

This paper uses data from the 1979 and 1997 National Longitudinal Survey of Youth cohorts (NLSY79 and NLSY97) to estimate changes in the effects of ability and family income on educational attainment for youth in their late teens during the early 1980s and early 2000s. Cognitive ability plays an important role in determining educational outcomes for both NLSY cohorts, while family income plays little role in determining high school completion in either cohort. Most interestingly, we document a dramatic increase in the effects of family income on college attendance (particularly among the least able) from the NLSY79 to the NLSY97. Family income has also become a much more important determinant of college 'quality' and hours/weeks worked during the academic year (the latter among the most able) in the NLSY97. Family income has little effect on college delay in either sample.

To interpret our empirical findings on college attendance, we develop an educational choice model that incorporates both borrowing constraints and a 'consumption' value of schooling – two of the most commonly invoked explanations for a positive family income – schooling relationship. Without borrowing constraints, the model cannot explain the rising effects of family income on college attendance in response to the sharply rising costs and returns to college experienced from the early 1980s to early 2000s: the incentives created by a 'consumption' value of schooling imply that income should have become less important over time (or even negatively related to attendance). Instead, the data are more broadly consistent with the hypothesis that more youth are borrowing constrained today than were in the early 1980s.

JEL Code: I21, I22, I28, J24

Keywords: Ability, Achievement, Borrowing Constraints, College, Credit Constraints, Family Income, High School

^{*} We are grateful for financial support from the Canadian Labour Market and Skills Researcher Network. We thank Flavio Cunha, Jim Heckman, Mike Keane, Abigail Payne, Sol Polachek and participants at the Inaugural Center of Human Capital and Journal of Human Capital Conference, 2007 University of Michigan/Michigan State/University of Western Ontario Labor Economics Conference, 2007 IRP Summer Research Workshop, ITAM, Johns Hopkins University, UCLA, University of Chicago's Harris School of Public Policy, University of Rochester, USC, and University of Western Ontario. Please send comments to llochner@uwo.ca.

Executive Summary

This paper uses U.S. data from the 1979 and 1997 National Longitudinal Survey of Youth cohorts (NLSY79 and NLSY97) to analyze changes in the effects of ability and family income on educational attainment for cohorts making their final schooling decisions in the early 1980s to the early 2000s. We document a dramatic increase in the effect of family income on post-secondary attendance rates (particularly among the least able), even after controlling for family background and ability. (Ability is mainly measured by scores on the Armed Forces Qualifying Test, AFQT, which was taken by all sample respondents; however, controlling for a broader array of cognitive and non-cognitive skills yields similar conclusions.) Youth in the NLSY97 from the highest income quartile were sixteen percentage points more likely to attend a post-secondary institution by age 21 than were youth from the lowest income quartile; that difference was only nine percentage points in the NLSY79. Combining the effects of wealth and family income in the NLSY97, we find that someone from the highest wealth and income quartiles was nearly 30 percentage points more likely to attend a post-secondary institution than someone from the lowest wealth and income quartiles. Additional estimates suggest that the effects of income on completion of two or more and four or more years of post-secondary schooling have also increased over time. Overall, our findings overwhelmingly suggest that family resources are an important component of post-secondary schooling decisions for recent cohorts – much more so than in the early 1980s. In contrast, we find little change in the effect of income on high school completion after controlling for ability and family background. Cognitive ability plays an important role in determining educational outcomes for both NLSY cohorts. The effects of ability on high school completion weaken somewhat for the later cohort, while its effects on post-secondary attendance are more stable over time.

To interpret these findings, we develop a model of post-secondary attendance that incorporates both borrowing constraints and a ‘consumption’ or ‘psychic’ value of schooling – two of the most commonly invoked explanations for a positive family income - schooling relationship. This model allows us to study whether these mechanisms can generate an increase in the effects of family income in response to three important economic and policy changes that took place between the early 1980s and the early 2000s: increasing returns to skills and education in the labour market, increasing tuition costs, and decreasing real borrowing limits. Our model suggests that among youth with positive net financial returns from post-secondary attendance, an increase in family resources raises the value of attending post-secondary schooling less than the value of not attending. This tends to generate a negative family income - attendance relationship in the population when the financial gains to post-secondary schooling are high. Given the well-documented increase in the returns to post-secondary education in the U.S. labour market, it is difficult to explain the increasing effects of family income on post-secondary attendance based only on a standard ‘consumption’ value story. In the presence of borrowing constraints, the model better predicts that the effect of family resources on post-secondary attendance will be positive. This can explain the stronger positive effect of income on post-secondary attendance in the NLSY97 (compared to the NLSY79) if recent cohorts are more likely to be borrowing constrained due to the higher financial returns to schooling, higher tuition costs, and lower real borrowing limits.

To further explore the effects of family income on other margins of choice (particularly those that may be affected by borrowing constraints), we empirically examine the effects of family income on the type of post-secondary institution attended, college/university delay, and work during the academic year for both NLSY cohorts. We find that family income has much larger effects on the 'quality' of institution attended for the more recent NLSY cohort but little effect on college/university delay in either sample. Delay itself has a strong negative effect on the quality of institution attended for both NLSY cohorts. Finally, we find significantly negative effects of family income on work activity among the most able in the NLSY97 but not in the NLSY79.

Much of the recent evidence arguing that borrowing constraints at post-secondary attendance ages are unimportant is based on the NLSY79, a sample of youth making their post-secondary attendance decisions over twenty-five years ago. Since then the returns to school in the labour market and tuition costs have increased while real student loan borrowing limits have eroded. This suggests that borrowing constraints may bind for many more youths today than in the early 1980s. Consistent with this, our findings suggest that family income has become a substantially more important determinant of post-secondary attendance in recent years. This result is difficult to reconcile with a model that relies only on a 'consumption' value of schooling, because such a model predicts a negative family income - post-secondary attendance relationship for individuals who financially gain from post-secondary schooling. Moreover, in the absence of binding borrowing constraints, the increase in the returns to education in the labour market should have weakened any positive income - attendance relationship. While broadly consistent with the increased role of family income over time, borrowing constraints are difficult to reconcile with two features of the data. First, income has a sizeable effect on post-secondary attendance among youths from the top half of the family income distribution, although these individuals are unlikely to be constrained by borrowing limits. Second, while borrowing constraints are more likely to bind for more able students, the estimated effects of income on post-secondary attendance for the NLSY97 are weakest for the most able. Smart but low-income youth appear to alleviate the effects of borrowing constraints by working part-time while enrolled in school, as evidenced by our finding that family income significantly reduces hours of work during the school year among the most able.