



Reconciling gender differences in the returns to education in self-employment: Does occupation matter?

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ABSTRACT

Compared to self-employed men, self-employed women have more education but considerably lower earnings, generating differences in the returns to education by gender. This paper finds evidence that men typically benefit from a complementary relationship between education and earnings. However, women are heterogenous in their returns to education. Women who self-employ in traditionally female occupations do not benefit from this complementary relationship, and women who self-employ in traditionally male occupations earn returns that are more similar to the male experience.

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1. Introduction

Self-employment offers numerous benefits to both the economy and individual. Anecdotal evidence indicates that self-employment creates jobs, keeps individuals in the labor force longer, and gives workers a more flexible work arrangement and the independence to be their own boss. Accordingly, it is no surprise that [Blanchflower and Oswald \(1998\)](#) find that self-employed workers have higher levels of both job and life satisfaction than wage and salary workers.

There has been an increase over time in workers choosing to self-employ, particularly among women. [Devine \(1994\)](#) uses data from the Current Population Survey (CPS) March Supplement and finds the female self-employment rate increased from 4.1% in 1975 to 6.7% in 1990. Using the same data and calculation method, this paper estimates the female self-employment rate in 2009 at 8.3%,¹ indicating the rate has doubled since 1975.²

What might generate this trend? The current literature that examines female self-employment focuses on the gender differences in the determinants of self-employment. Like men, women who self-employ are more likely to be older, white, and have more

education than their wage and salary counterparts. In contrast, however, family factors such as being married and having young children play a much larger role for women than men. Many women utilize self-employment as a means for joint production – the ability to combine labor market and household production.

One determinant that has been overlooked in the current literature on self-employed women is education and particularly the returns to education. Previous literature notes that regardless of gender, the self-employed have higher average levels of education than their wage and salary counterparts, but no research investigates the returns to these high levels of education for women. From an individual point of view, analyzing the return to education provides a measure of the financial payoff that an individual receives from investing time and money into her education. From a macroeconomic point of view, studying the returns to education provides a guide for educational policy. Many business schools have expanded their offering of courses, majors, minors, and student organizations in the field of entrepreneurship as the more traditional business course offerings had not previously provided an option for students interested in self-employment. In addition, some schools are starting to reach out to women specifically by offering women's entrepreneurial resource centers, as well as courses and minors that coincide with professional training in the most common occupations of self-employed women. Still, there is a lot that economists and other social scientists do not know about the role of education in self-employment, and especially among women.

Given the lack of research on the returns to education for self-employed women, this paper attempts to fill in the gap by comparing the returns to education for self-employed men and women.

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¹ The self-employment rate is defined as self-employed workers divided by the sum of self-employed and wage and salary workers. This calculation includes wage and salary workers working in the private or public sector; however, the rest of this paper excludes wage and salary workers working in the public sector.

² To compare, the male self-employment rate rose from 10% in 1975 to 12.4% in 1990 ([Devine, 1994](#)). This paper calculates the male self-employment rate in 2009 at 14.6%.

Its purpose is to examine whether the returns to education differ by gender, across the earnings distribution, and by occupational class. It analyzes how the heterogeneity of self-employed women differentially affects their returns to education, and attempts to explain why particular occupations for women can actually result in payoffs that are more similar to the returns to education for men.

This paper is organized as follows. First, a brief review of the self-employment literature provides a background of the research that estimates the returns to human capital, as well as the literature that analyzes the differences in the characteristics of men and women. The data are then defined and examined for descriptive statistics and results are presented on the gender differences in the returns to education for self-employed workers. Finally, the results of the paper are summarized and recommendations for future work are made.

2. Literature review

2.1. Returns to education in self-employment

The literature that estimates the returns to human capital mainly focuses on wage and salary workers, whereas few papers estimate the marginal returns to education for self-employed workers. Among these few papers, the focus is to either estimate the returns for self-employed men or compare the returns by employment sector. *Evans and Leighton (1989)* use OLS and National Longitudinal Survey (NLS) data to estimate a 10.3% marginal return to one year of schooling for self-employed men. *Borjas and Bronars (1989)* also use OLS to estimate the returns to education for self-employed men, but use data from the 1980 Census. They estimate the return to a college degree for self-employed white men at 41.1%. Unlike the rest of the literature, *Hundley (2001)* estimates comparative earnings equations by gender, specifically the effect of holding a professional degree on annual earnings. He finds self-employed women benefit from the highest return of 151% to annual earnings, while self-employed men only earn a 53% return. In a contrasting study, *Cleveland and Hyatt (2002)* find that women who self-employ as childcare workers (who are by far the modal occupation) earn only modest returns to education, as well as low returns to experience and tenure.

When estimating the returns to self-employment, researchers debate the presence of selection bias. If workers self-select into self-employment, then the marginal effect of an additional year of schooling will reflect not only whether education impacts earnings, but also the possibility that low- or high-ability workers selected into self-employment. Two similar papers that examine the role of selection in the employment sector choice of men are *Rees and Shah (1986)* and *Gill (1988)*. Both papers use the *Heckman (1979)* selection correction methodology by estimating a probit equation for employment sector choice to construct a selectivity variable that is included in OLS earnings equations for wage and salary workers and the self-employed. They do not find selection bias in the earnings of the self-employed, which they interpret in one of two ways – an indication that there would be no difference in mean earnings had these same workers entered the wage and salary sector, or the result of using a small sample of self-employed workers.

2.2. Returns to education using quantile regression

More recent literature uses quantile regression to better understand the marginal effect of schooling across the earnings distribution. This approach suits the self-employed, as their earnings distribution is much wider relative to the earnings distribution of wage and salary workers, and the right-tail of the distribution

is skewed by a small number of highly successful small business owners.

An early example of this methodology applied to the wage and salary sector is *Buchinsky (1998)*, who compares the return to education that is estimated using OLS with the returns using quantile regression at the .10, .25, .50, .75, and .90 quantiles. Using a sample of white men in 1992 from the CPS, the return to one additional year of schooling estimated by OLS is 0.2–0.4 percentage points lower than the estimate attained using median regression.³ And across the earnings distribution, workers in the .90 quantile benefit from a 0.9–1.1 percentage point increase in earnings for every additional year of schooling.

The returns to education for men in both employment sectors are reviewed by *Hamilton (2000)*, who uses data from the 1994 Survey of Income and Program Participation (SIPP).⁴ For the wage and salary sector, OLS and quantile regression at the .25, .50, and .75 quantiles result in similar estimates of the returns to education and experience. This uniformity is expected, given the relatively symmetric distribution of earnings among employees. However, for the self-employed, the return to education is lower at the .25 and .50 quantile and higher at the .75 quantile, compared to the return to education that is estimated using OLS regression. For example, when controlling for potential experience and current tenure and using OLS, a self-employed male earns an additional 3.4% in earnings with a college degree. However, compared to men with less than a high school education, the return to a college degree is 1.1, 2.5, and 4.5% at the .25, .50, and .75 quantiles, respectively.⁵ *Hamilton* also finds that the self-employed incur a relatively smaller penalty for less education. For example, when estimated at the median, the penalty for not attaining a college degree for the self-employed worker is a 2.4% reduction in earnings. However, the wage and salary worker's earnings drop 3.9% when he does not have a college degree. This finding could be interpreted as a sheepskin effect, whereby employers screen workers according to their ability to complete a degree.

Arias et al. (2000) estimate the returns to education for wage and salary workers using instrumental variables quantile regression and data on twins. Education, measured as years of schooling, and unobservable ability are treated as two separate factors in the generation of human capital. They regard the earnings distribution as a reflection of the range of unobservable ability, so that people with relatively low earnings are believed to have less ability and people with relatively high earnings are believed to have more ability. Because OLS merely estimates the return to education for individuals with an identical (mean) level of ability, they use quantile regression to better analyze the effect of education for individuals of various ability levels measured by relative earnings. The main finding of the paper is that education and unobserved ability have a complementary relationship, implying education has an additional indirect effect on human capital, and therefore helps high-ability individuals more.

Although the paper does not measure returns to education for the self-employed, it briefly investigates gender differences in returns for wage and salary workers for the purpose of determining

³ *Buchinsky (1998)* reports the marginal returns to education for five groups of education-experience combinations. For example, workers with 12 years of schooling and 15 years of experience have a mean return to education of 11.6% and a median return to education of 11.9%.

⁴ *Hamilton (2000)* uses the SIPP in order to construct three comparative measures of earnings for the self-employed, only two of which are available in the CPS.

⁵ *Hamilton (2000)* tests for selection bias using a two-year panel from the SIPP, where an earnings equation is estimated in the first year that includes a dummy variable indicating whether the worker switched from a wage and salary job to self-employment the following year. This method does not provide significant evidence of selection bias for the self-employed.

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