The Value of an Additional Job Offer

Bo Cowgill
Columbia University

September 27, 2017

Preliminary and incomplete.

Abstract

What's the causal effect of an extra job offer on a worker's life outcomes? Prior efforts to measure these effects have proven difficult because of the endogeneity of offers. This paper overcomes this problem using variation coming from a screening experiment at a large employer. Three years after the experiment, workers who randomly received an extra offer are more likely to stay within their industry, to become a manager and/or to become an executive (typically, a C-level manager of a startup). *Work in progress. Additional results measures about many other outcomes, including marriage outcomes, salary outcomes and non-compete -related outcomes are available shortly.*[1]

[1]Email bo.cowgill@columbia.edu for an updated draft.

1 Introduction

What's the value of an additional job offer? In many areas of scholarship and public policy, competition between employers for workers is a critical variable. Without competition between employers, even the most capable workers cannot enjoy higher incomes. Demand for labor is a central feature for many macroeconomic models. A growing literature about non-compete agreements and employer collusion (Starr, 2016; Krueger and Ashenfelter, 2017) shows the deleterious effects of reducing competition between employers.

Measuring the effects of competition on employees wages and careers is confounded by endogeneity. Workers who receive many job offers might also enjoy high wages, entrepreneurial opportunities and innovation outcomes. However, this relationship may not be causal – other factors (the workers talent) may be responsible for these correlations.

Economists have also recently uncovered the large role of firms in inequality (Song et al., 2015). Firms equally to (or more than) occupations in explaining incomes. However, this research also faces endogeneity challenges. Recruitment into a particular firm may not cause a worker to be wealthier; endogenous sorting may place productive workers in the same firm even if they would be equally productive and well-paid elsewhere.

This paper uses variation from a field experiment to identify the effects of greater labor market competition, and particularly the effect of a job offer from a relatively high-productivity firm. Through random variation in interviews and job offers, the experiment solves the identification problems described in the above literatures.

As outcome variables, I collect data from from LinkedIn and other public datasets about employee mobility and entrepreneurial activity, between three and four years after the intervention. To measure the effects on wages, I use data from salary consultancy to estimate wages at current levels. This experiment thus permits a well-identified estimate on the effects of additional competition on wages, innovation outcomes and entrepreneurship.

2 Experimental Variation

The experimental variation comes from a screening experiment undertaken by a firm. In the experiment, the employer discovers a new job screening technique that yields a new population of hirable-workers. In order to test the technique, the employer interviewed a randomly selected half of applicants from this new population, many of which converted into job offers. The other randomly selected half were interviewed only if the pre-existing screening method identified the candidate.

The Venn Diagram in Figure 1 aids visualization of the screening experiment. Circle A represents the job applicants selected by the firm's incumbent screening strategy. Circle B represents the applicants identified by the new strategy. Some candidates fall into the intersection region ($A \cap B$). The experiment guaranteed an interview to a random half of applicants in Circle B. This includes some candidates in the intersection region, but also many who would never be interviewed at all without the new screening.

Random selection into the "guaranteed interview" group is thus an instrument for greater competition. Workers in the treated group experienced at least one additional bid for their labor than their control group counterparts. Workers may have used this additional option as leverage with their current (or another, prospective) employer to obtain higher wages or better entrepreneurial opportunities.

Table 1, Panel A shows randomization worked well, and that covariates are balanced on both sides of the instrument. Table 1, Panel B shows that the experiment had a strong effect on who was interviewed and given a job offer. Although some control group workers were independently discovered by the status-quo hiring process, the instrument roughly doubled the chances of a worker (in this group) being hired.

Preliminary results show moderate to large effects on many aspects of the workers' post-application careers. Treated workers are more likely to stay within their industry, to become a manager and/or to become an executive (typically, a C-level manager of a startup).

References

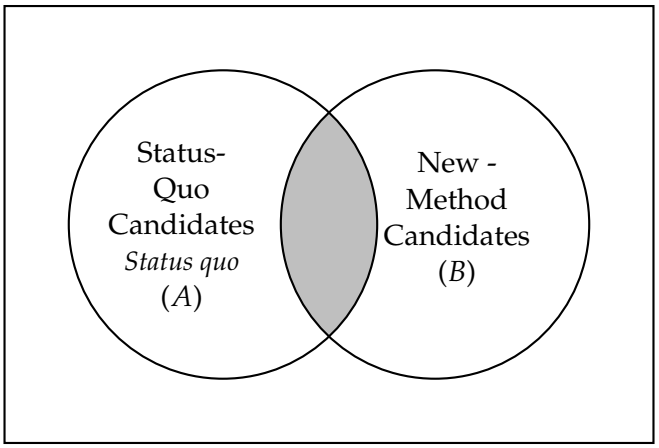
Krueger, Alan B and Orley Ashenfelter, "Theory and Evidence on Employer Collusion in the Franchise Sector," *Working Paper*, 2017.

Song, Jae, David J Price, Fatih Guvenen, Nicholas Bloom, and Till Von Wachter, "Firming up inequality," Technical Report, National Bureau of Economic Research 2015.

Starr, Evan P, "Consider this: Training, wages, and the enforceability of covenants not to compete," *Working Paper*, 2016.

Tables and Figures

Figure 1: Visualization of Effects of Changing Screening Methods



Notes: The above is a useful visualization of the empirical setting. The left circle A represents candidates selected by the status quo. The right circle B represents candidates selected by the new method. The shaded area $A \cap B$ represents candidates accepted by both. The goal of the empirical analysis is to compare the average outcomes between the unshaded areas of A and B ($A \setminus B$ vs $B \setminus A$).

Table 1: Covariate Balance and Acceptance Rates (Basic Averages)

Panel A: Characteristics

	Treatment	Control	Difference
Has Doctorate	0.26	0.28	-0.02
Ever Attended Elite School	0.62	0.58	0.04
Ever Attended Top Tier School	0.28	0.31	-0.04
Ever Attended Non-Selective School	0.03	0.03	-0.00
Average Elite of all Schools Attended	0.56	0.51	0.04
Referred	0.13	0.15	-0.02
No Work Experience (New Graduate)	0.22	0.19	0.03
Rare School	0.41	0.39	0.02

Panel B: Cumulative Acceptance Rates

	Treatment	Control	Difference
Interview	0.84	0.56	0.28***
Job Offer	0.21	0.11	0.10***
Accept Offer	0.17	0.08	0.09***

Panel C: Incremental Acceptance Rates

	Treatment	Control	Difference
Interview	0.84	0.56	0.28***
Job Offer	0.25	0.20	0.05
Offer Accept	0.80	0.71	0.09

Notes: The above comparisons are of raw means. See later tables for estimated differences of averages with controls, and for IV-based estimates of marginal effects.

Panel A presents covariate balance between treatment and control groups in the "Above the threshold" applicants.

Panel B shows cumulative acceptance rates (the rate of applicants who made it from the beginning to each stage). The second row of Panel B can be read to mean, "Of all applicants who applied, X% were extended an offer."

Panel C shows incremental acceptance rates (pass rates of applicants were accepted until the previous stage). The second row of Panel C can be read to mean, "Of all applicants who *were interviewed*, Y% were extended an offer."

* significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are robust.

Table 2: Average Success Rates (Regressions w/ Controls)

Panel A: Cumulative Acceptance Rates

	Interview	Job Offer	Accept Offer
Treatment	0.28***	0.095***	0.082***
	(0.032)	(0.025)	(0.023)
R^2	0.12	0.13	0.13
Observations	770	770	770

Panel B: Incremental Acceptance Rates

	Interview	Job Offer	Accept Offer
Treatment	0.30***	0.078**	0.10
	(0.033)	(0.036)	(0.077)
R^2	0.19	0.22	0.27
Observations	770	544	124

Panel C: Marginal Success Rates using Instrumental Variables

	Job Offer	Accept Offer
Interview	0.36***	
	(0.089)	
Job Offer		0.90***
		(0.12)
F-stat (1st Stage)	81.6	16.1
Mean Outcome of Control	0.20	0.71
Difference	0.16*	0.18*
Mean Outcome of Population	0.026	0.84
Difference	0.33***	0.06***
Observations	38242	38242

Notes: The above tables contain linear regressions of arriving at each stage (passing the previous) conditional on the treatment and controls. Controls include the month of the application, whether the applicant was referred and education and experience controls. Panel A shows cumulative acceptance rates (the rate of applicants who made it from the beginning to each stage). Panel B shows incremental acceptance rates (pass rates of applicants were accepted until the previous stage).

Panel C shows marginal passthrough rates of the machine's additional candidates. This differs from the average succes rates, as measured in Panel A and B and in earlier tables. In the average success rate numbers above, the "Treatment" includes both the candidates both methods selected as well as those that the machine selected but the human screeners would not have. In Panel C, I use the treatment/control status to isolate the success rates of the "marginal" candidate whom the machine liked but the human screeners would have rejected. I then compare these "marginal" success rates to the incremental success rate in the control group. The results are reported in the "Difference" row. The marginal candidates pass the interview and accept offers at a higher rate than the control group.

* significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors are robust.

Appendices

References