Lecture Note 21 — Signaling and Statistical Discrimination: An Application to 'Ban the Box' Legislation

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Introduction

It's possible to develop the misimpression that information economics is mostly designed to explain cute and quirky phenomena: why GED holders earn more than similarly-skilled non-GED holders, why people are reluctant to buy used cars, why insurance companies charge such high prices for low-deductible auto policies, etc. This lecture will correct that misimpression. Information or the lack thereof—matters in markets.

One of the places where information matters most is in employment: specifically, who gets hired and who does not. Hiring a worker is somewhat akin to buying a jet ski or a used car. You don't really know what 'quality' of worker you're going to get until after you've worked with an individual for a while. If it turns out that you have made a bad hiring decision, you can ultimately dismiss (AKA fire) the worker. But firing is unpleasant, disruptive, and sometimes legally risky (AKA expensive). Employers therefore have an incentive to gather information about applicants prior to hiring to assess their quality and fit.

You might surmise that job applicants would therefore have an incentive to *conceal* information so employers don't draw any negative inferences. But that's not necessarily true. Job applicants who have *positive* information to reveal will have an incentive to reveal that information. And as we saw in the signaling model, one group's decision to reveal positive information about itself can have adverse consequences for other groups that don't have similarly positive information. In the Spence model, workers who reveal themselves to be of High ability by obtaining high levels of schooling implicitly reveal workers who did not obtain high levels of schooling to be of Low ability.

Noting the harm done to Low ability workers by this signaling process, policymakers might decide to pass a law that banned employers from asking applicants about how much schooling they had obtained. As a 14.03/003 student, you might hypothesize that this rule would be bad for High ability workers but good for Low ability workers (effectively a transfer between these two groups). In reality, it could be worse than that. Depending on employers' aversion to Low ability workers, they may choose not to hire anybody rather than risk hiring a Low ability worker (see Problem Set 6, Question 2 to solidify this intuition).

1 Criminal History, Employment Screening, and the Ban-the-Box Movement

Aside from the tiny Republic of Seychelles, the U.S. has the highest fraction of its population incarcerated in the world: 699 prisoners per 100K residents.[1] Of course, many more people have been to prison than are currently in prison. A current working paper estimates that in 2010, 6% of non-African-American adults and 25% of African-American adults were either current felons or former felons. [2] Given that most (not all) felonies are committed by men, these statistics would suggest that the fraction of non-African-American and African-American *men* who are felons or former felons is on the order of 10% and (perhaps) 40% respectively. It is hard *not* to find these numbers startling.

Individuals convicted of a felony face substantial barriers to reintegration and economic self-sufficiency after their felony convictions. Many employers ask job applicants whether they have a felony conviction. Employers may frequently choose not to consider applicants who answer yes. This type of applicant screening is not unlawful. In the U.S., it is legal to discriminate on any characteristic *other* than race, sex, disability, union membership, and age (over 40), so long as the characteristic in question can be considered job relevant (e.g., it would not be legal to discriminate on physical strength for a telephone operator position, but it would be legal to discriminate on physical attractiveness for a maître d' position at a restaurant).

As reported in the 2016 paper by Agan & Starr on your syllabus, in an effort to reduce barriers to employment for people with criminal records, more than 100 U.S. jurisdictions (cities and towns) and 23 states have passed "Ban-the-Box" (BTB) policies. Although the details vary, these policies all prohibit employers from asking about criminal history on the initial job application and in job interviews. Employers may still conduct criminal background checks, but only at or near the end of the employment process. Most BTB policies apply to public employers only, but seven states (including New Jersey) and a number of cities (including New York City) have now also extended these restrictions to private employers.

Agan and Starr succinctly describe the rationale for these policies. "These laws seek to increase employment opportunities for people with criminal records. They are often also presented as a strategy for reducing unemployment among black men, who in recent years have faced unemployment rates approximately double the national average (Bureau of Labor Statistics 2015). The theory underlying this strategy is straightforward: black men are more likely to have criminal convictions than other groups (Shannon et al. 2011), and having a criminal record is a substantial barrier to employment (Pager 2003; Holzer, Raphael, and Stoll 2006; Holzer 2007; Pager, Western, & Bonikowski 2009). Thus, a policy that increases the employment of people with records should disproportionately help minority men."

[1] https://en.wikipedia.org/wiki/List_of_countries_by_incarceration_rate

[2] Shannon, Sarah K.S., Christopher Uggen, Jason Schnittker, Melissa Thompson, Sara Wakefield, and Michael Massoglia. "The Growth, Scope, and Spatial Distribution of People with Felony Records in the United States,1948 to 2010." Conditional Accept at *Demography*.

They also succinctly describe the potential concern with these policies. "This effort could have unintended consequences, however. In the absence of individual information about which applicants have criminal convictions, employers might statistically discriminate against applicants with characteristics correlated with criminal records, such as race. In this scenario, applicants with no criminal records who belong to groups with higher conviction rates, such as young black males, would be adversely affected by BTB policies."

2 A Simple Model of Ban-the-Box

Let's formalize a model of how Ban-the-Box might help felons or hurt non-felon minorities. Consider a firm looking to hire its next worker. The firm pays a fixed wage for a given position, and prefers to hire a worker from Group 1 (e.g., a minority worker) but could also hire a worker from Group 2 (e.g., a non-minority worker). The firm can instantly determine whether an applicant is from Group 1 or Group 2. Unfortunately, a fraction λ of Group 1 workers are felons (F), which the firm is averse to hiring. Non-felons (N) comprise a fraction $(1-\lambda)$ of Group 1, and there is a negligible proportion of felons in Group 2. (We could add a small fraction of felons into Group 2 without changing the takeaway of the model.) Denoting the firm's payoffs by π, the firm has

$$\pi_F < \pi_2 < \pi_N$$

When firms are able to distinguish between felons and non-felons, they will hire a non-felon. If a non-felon from Group 1 is unavailable, they will hire someone from Group 2. Felons will very rarely be hired. (The model would not fundamentally change if $\pi_2 = \pi_N$, but there would be an indeterminacy about who the firm would hire that would make this exposition more complicated.)

Next, consider what happens when firms cannot distinguish between felons and non-felons in Group 1. They will hire from Group 1 if this is more profitable than hiring from Group 2:

$$\lambda\pi_F + (1-\lambda)\pi_N > \pi_2$$

Examining this inequality, you can see that felons will be hired more often when (1) non-felons from Group 2 are very profitable (π_N large) (2) felons from Group 1 are not very *un*profitable (π_F reasonably close to π_2); and (3) felons are a modest proportion of Group 1 (λ small). However, suppose π_N is not much larger than π_2, π_F is notably smaller than π_2, and λ is reasonably large. In that case, non-felon members of Group 1 will not be hired—even though they are very productive—because they get lumped in with felons from Group 2.

To help convince you that this is a reasonable (albeit simplified) model of the hiring decision, note that this screening technology is likely to exist in an unregulated market. Suppose firms had to pay c units in profit to introduce a screening technology that would allow them to screen non-felons

from felons. They would be willing to pay for this technology if

$$\pi_N - c > \lambda\pi_F + (1-\lambda)\pi_N$$

$$\Rightarrow \pi_N > \pi_F + \frac{c}{\lambda}$$

You can think of this cheap technology as "the box," i.e., "have you ever been convicted of a felony?" Since putting a box on the application form is relatively cheap ($\frac{c}{\lambda}$ small), we should expect that firms are likely to use "the box" when it is legally available.

In addition to "the box," firms could use formal criminal background checks at a cost $k > c$. "Ban-the-box" regulations do *not* prevent firms from doing these costlier criminal background checks *after* interviewing a candidate. What if the firm does not use the box in initial interviews, and screens out felons using this costlier method? We know that they would rather hire a candidate from Group 2 than a felon from Group 1. In considering whether to interview a candidate from Group 1 or from Group 2, the firm will thus choose to pursue a candidate from Group 1 if and only if the chance of this candidate being a non-felon makes up for the cost of the background check:

$$(1-\lambda)\pi_N - k > \pi_2$$

$$\Rightarrow k < (1-\lambda)\pi_N - \pi_2$$

This condition may not hold if background checks are costly (k large), if a high proportion of Group 1 are felons ($1-\lambda$ small), or if there's little benefit to hiring a non-felon from Group 1 instead of a member of Group 2 ($\pi_N \approx \pi_2$). So if background checks are costly, this probably doesn't undo the damage from banning the inexpensive screening technology of ban-the-box.

3 Evidence

So is ban-the-box *good* for former felons who could use a leg up? Under some conditions, ban-the-box legislation is likely to help felons by pooling them with desirable non-felons. However, in other cases, ban-the-box legislation could hurt minorities as a whole, since firms could shy away from hiring minorities that might be felons when they can't screen for this characteristic at a low cost. Unfortunately, the evidence that economists have accumulated so far suggests that the second case is more likely to hold in the modern U.S. labor market.

In class, we will discuss the Agan & Starr (2016) working paper, which provides the best evidence available to date.

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