Journal of Public Economics 91 (2007) 1151 – 1166
www.elsevier.com/locate/econbase

Belief flipping in a dynamic model of statistical discrimination ☆

Roland G. Fryer Jr.

Harvard Society of Fellows and NBER; Littauer Center; 1875 Cambridge Street; Cambridge, MA 02138, United States

Received 11 March 2004; received in revised form 3 April 2006; accepted 25 May 2006
Available online 12 January 2007

Abstract

The literature on statistical discrimination shows that ex-ante identical groups may be differentially treated in discriminatory equilibria. This paper constructs a dynamic model of statistical discrimination and explores what happens to the individuals who nonetheless overcome the initial discrimination. If an employer discriminates against a group of workers in her initial hiring, she may actually favor the successful members of that group when she promotes from within the firm. The worker's welfare implications (i.e. who benefits from an employer's discriminatory hiring practices) are unclear. Even though agents face discrimination initially, some may be better off because of it.

Keywords: Statistical discrimination; Job assignment game

1. Introduction

The theoretical literature on statistical discrimination shares a common theme: equilibria exist in which a group is discriminated against relative to another, even when groups are ex-ante identical and employers have no psychic preference for either group. The question that has been hitherto ignored, within these models, is what happens to the agents who overcome the initial adversity in hiring and are assigned to a job within a firm. This paper addresses this question by formalizing the following simple intuition. Suppose an employer has negative stereotypes about a particular group (group A, say) and discriminates against them in her initial hiring practices,

☆ I would like to give special thanks to Tomas J. Sjöström and Glenn C. Loury for continued support and advice on this project. I would also like to thank Gary Becker, Kalyan Chatterjee, Kim-Sau Chung, Hanming Fang, Vijay Krishna, Jim Jordan, Xue Jun, Steven Levitt, Brian McCannon, Andrea Moro, Roger Myerson, Peter Norman, Tor Winston, and seminar participants at the Universities of Chicago, Virginia, and Pennsylvania State. The usual caveat applies.
E-mail address: rfryer@fas.harvard.edu.

0047-2727/$ - see front matter © 2007 Published by Elsevier B.V.
doi:10.1016/j.jpubeco.2006.05.015

relative to another group (group B) for whom she has more positive stereotypes. Then, conditional on being hired, group A workers within the firm are relatively more talented than group B workers. This result arises because group A workers in the firm were held to a more exacting standard in initial hiring, relative to B's. Employers may take this into account in their favor when they promote from within the firm. Thus, although A's are subjected to initial adversity, once hired, they may be more likely to be promoted.[1] I refer to this as "belief flipping" — being pessimistic about a group in general, but optimistic about the successful members of that group.

The main result in this paper is a sufficient condition for "belief flipping" to arise in a dynamic equilibrium of a simple two-stage job assignment game. Whether or not belief flipping obtains is driven by two effects: a *talent* effect and an *investment* effect. In standard (one-stage) models of statistical discrimination, when an employer changes her hiring standards, this influences the worker's investment behavior (investment effect). In a dynamic model, an employer's asymmetric initial hiring standards also induce an endogenous talent effect in later stages of the game. The talent effect is always positive; higher initial standards imply a more talented pool of workers in the firm. The investment effect, however, may be positive or negative because there may be continued discrimination in the promotion stage. If the investment effect is positive, belief flipping will arise. If the investment effect is negative, then the magnitude of the talent effect must outweigh that of the investment effect. Careful attention to the details will highlight the following "rule of thumb:" if a worker's promotion stage wages and the employer's profit margin on offered wages take on intermediate values, belief flipping can occur.

This result may seem innocuous. Technically, beliefs can flip in one-stage statistical discrimination models if the game were to be trivially repeated twice, and group B, for example, was discriminated against the first time the game was played relative to group A, and the second time group A was discriminated against relative to group B. This type of crude argument, however, is (1) not particularly interesting, given there is no link between the stages (i.e., employers cannot make inferences about workers in later stages of their career, as a function of their previous play) and (2) implicitly relies on an unspecified equilibrium selection mechanism that for some (ad hoc) reason chooses to discriminate against Bs the first time the game is played and discriminate against As the second time the game is played. In the model presented here, there is an explicit link between the two periods that allows the employer to discern group specific characteristics about the workers over time.

When belief flipping occurs, who benefits from the employer's discriminatory hiring practices is unclear. The ex-ante expected payoff of the group who faces the initial discrimination is always lower than the group who does not face this discrimination. Ex-post, however, workers who are hired despite the employer's animus towards their group benefit from the initial adversity. More succinctly, B's would prefer to be A's before the initial hiring process, but conditional upon being hired, they are happy to be B's.

The seminal contributions to the statistical discrimination literature consist of Phelps (1972) and Arrow (1973). Phelps (1972) assumes that the signal minorities emit is nosier, and therefore, employers (rationally) discriminate against them in equilibrium. Arrow (1973) argues that employers can (rationally) discriminate against a group, even when they are ex-ante identical, and the employer herself does not have taste-based group prejudice. He notes that when some employee characteristics are endogenous, an employer's *a priori* beliefs can be self-fulfilling. Two important contributions in this literature are Coate and Loury (1993) and Moro and Norman (2004). Coate

[1] Of course, this does not imply that the number of A's that is promoted will be more than the number of B's. Or, that ex-ante expected welfare of A's will be greater than B's.