Endogenous negative stereotypes: A similarity-based approach

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ABSTRACT

This paper develops a model of similarity-based predictions combined with heterogeneous and endogenous information about population groups. Group-specific evaluations of decision makers endogenously result from former interactions with group members. A priori, no group-specific preferences or prior beliefs exist. The model provides a possible explanation for the discrimination of outgroups, minorities, and immigrants, as well as for the persistency and heterogeneity of discrimination. Further, the model allows us to analyze how discriminating attitudes themselves can be affected by anti-discrimination policies. We show that affirmative action reduces negative stereotypes towards minorities and immigrants, but the effect is rather small.

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1. Introduction

The statistical discrimination approaches of Arrow (1973) and Coate and Loury (1993) model discriminatory labor market outcomes as a rational expectations equilibrium. They show that multiple equilibria with correct expectations are possible with distinct group-specific wage levels. In their models, employers' willingness to hire depends on their beliefs about workers' skill levels, which in turn determines the rate of return on skill investment, which determines the actual skill levels of the workers. Alternative approaches to statistical discrimination are presented by Aigner and Cain (1977), Lundberg and Startz (1983) and Lundberg (1991). They assume group specific differences in the precision of information which generate a lower rate of return on human capital investment for the group with less reliable qualification, which in turn leads to a lower human capital investment.[2]

We address the following new and complementary questions to the statistical discrimination theory: Why in particular are minorities and immigrants discriminated? Why do economic agents discriminate between members of their own group, denoted as ingroup, and members of other groups, denoted as outgroups? Which factors influence group-specific beliefs and the precision of information? Why are discriminating attitudes persistent and heterogeneous as found in field studies like that by Bertrand and Mullainathan (2004)? It is important to investigate these questions for two reasons, first, to get a more precise picture of the forces driving negative stereotypes, as Blank, Dabady, and Citro (2004, chapter 12) noted that

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more theoretical work on discrimination is necessary to understand the decision-making processes behind discriminating behavior, and second, to deduce appropriate policies to reduce negative stereotypes.

This paper develops a model with heterogeneous and endogenous information about population groups in an uncertain environment. Decision makers predict the result of collaborating with a group member using the similarity-based approach to prediction by Gilboa et al. (2006). The similarity-based approach offers a first formal cognitive approach to prediction using data points from similar environments.[3] Group-specific evaluations of decision makers endogenously result from former interactions with group members. A priori, no group-specific preferences or prior beliefs exist. Information gathering is modeled with a Poisson process, which relates the databases, summarizing the experiences with members of each group, to elementary parameters characterizing the economy which are group sizes, decision powers of the groups, contact rates within and between groups, and residence duration of group members. To keep the model tractable, we work out conditions such that the average evaluation of group members is a strictly increasing function of the database size, which measures the quantity of information about a group. Decision makers are averse to ambiguity, which is motivated by the Ellsberg Paradox and subsequently related experimental evidence. For this purpose, the paper introduces a tractable model of learning under ambiguity which includes a specification of learning the so-called similarity function. For reasonable parameters, the model is able to reproduce many of the most salient patterns concerning discrimination emphasized by empirical studies, i.e., that outgroups, minorities and immigrants are discriminated, as well as that discrimination is persistent and heterogeneous.[4]

The contribution of the paper is to provide a first model which relates stereotypes to basic parameters of an economy, which are group sizes, decision powers of the groups, contact rates within and between groups, and residence duration of group members. This relationship cannot be modeled with the existing approaches of statistical discrimination since these determine equilibrium beliefs by imposing rational expectations, which however, do not specify the cognitive process of belief formation and thus, the determinants of beliefs. The model provides a possible explanation for the discrimination of outgroups, minorities, and immigrants, as well as for the persistency and the heterogeneity of discrimination. Further, the concept of similarity allows to model learning from other environments which is not possible with expected utility theory. The similarity-based approach enables to describe predictions in situations where a decision maker never faces the same problem twice. It could explain why decision makers also discriminate against a group in a specific circumstance even if they have no experience with the group for that circumstance. We illustrate that also without the critical assumptions of unobservable skill investments or a priori group specific differences in the precision of information, by the existing statistical discrimination approaches, discriminating attitudes arise under general assumptions. The modeling of prior knowledge and information quality dependent on the basic characteristics of the economy offers the possibility of analyzing how discriminating attitudes themselves can be affected by policy. We show that affirmative action unambiguously decreases discriminating attitudes towards minorities and immigrants. However, the quantitative effect is rather small and affirmative action might increase ingroup–outgroup discrimination.

The intuition behind the results of the paper is as follows. Ambiguity averse decision makers prefer groups they know well to groups they know less. The knowledge of decision makers about a group is formalized by their database, which is on average larger from the own group, the majority and the native group, since, on average, decision makers have more contacts with these groups. Thus, decision makers prefer on average members from the own group, the majority and the native group. Since affirmative action leads to for more interaction with discriminated groups it decreases discriminating attitudes towards these groups.

This paper is structured as follows. Section 2 introduces the model. Section 3 derives the average evaluations of groups for identical and heterogeneous observable characteristics. Section 4 analyses policy implications. Section 5 concludes.

2. The model

2.1. Environment

The economy consists of a continuum of two types of agents, group members and decision maker each with mass 1. Fraction $p_l \in [0, 1]$ of the group members is from group l, with $l = A, B$ and $p_A + p_B = 1$. Group A is the majority and group B denotes the minority with $p_A > p_B$. A group's distinguishing characteristic could be ethnic group, religion, etc.. Decision makers are e.g. employer, landlords etc. and belong to group A or B. They are indexed by $j \in J$, where $\pi(j)$ is the measure of decision makers with index j. The task of decision makers is to evaluate group members. The share of decision makers from group l is denoted by Λ_l, with $\Lambda_l \in (0, 1)$ and $\Lambda_A + \Lambda_B = 1$. Λ_l measures the decision power of group l. If a decision maker collaborates with a group member, she receives a real-valued result Y which is uncertain. The decision maker knows that the expected result depends on a real-valued vector $X = (X^1, \dots, X^m) \in \mathbb{R}^m$ of observable variables, which characterize group members as well as the circumstances of a collaboration. However, the decision makers do not know the joint distributions of Y and X, $f_A(Y, X)$ and $f_B(Y, X)$, of groups A and B. $f_A(Y, X)$ and $f_B(Y, X)$ are time invariant to guarantee that the databases are informative about $f_A(Y, X)$ and $f_B(Y, X)$.

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[3] The concept of similarity has been intensively investigated in the psychology literature (see Goldstone and Son, 2005 for an overview). Grosskopf et al. (2008) provide first experimental evidence that similarity judgments are relevant for economic applications.

[4] See Altonji and Blank (1999) and Blank et al. (2004) for reviews of the empirical literature.