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Group Conflict, Racial Inequality, and Stratification

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Abstract

We present a simple equilibrium model of group conflict between a dominant and a marginalized group that builds on Lewis (1985) and more recently Darity (2001). The model formalizes several key insights of stratification economics (Darity, 2005): to begin with, discrimination is a purposeful activity pursued by dominant groups in order to maintain their status in society. However, not every member of the dominant group needs to fully engage in discriminatory effort. In other words, dominant group members can free ride on discriminatory actions taken by members of the same group. At the same time, though, someone must have discriminated, otherwise discrimination would not exist in equilibrium. We also show that discrimination is wasteful from a societal standpoint; yet, it persists because of the dominant group’s interest in maintaining their status, the fact that marginalized groups’ agency in lessening the effects of discrimination has costs, and the costly and imperfect nature of anti-discrimination enforcement. In particular, when the burden of proving discriminatory behavior falls on individuals in the marginalized group, discrimination will never be completely removed. Finally, we highlight how racial income inequality reverberates into wealth inequality (i.e. stratification), and we discuss the role of reparations in mitigating such outcomes.

Keywords: Group Conflict, Stratification, Racial Inequality.

JEL Codes: D31, D63, D74.

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1 Introduction

Stratification economics views racism and other forms of intergroup discrimination as a mechanism to maintain unearned or inherited advantage or privilege in a world of unequal rewards and differential opportunity (Darity, 2001), or a rational defense mechanism of the dominant group against marginalized groups (Chelwa, Hamilton, and Stewart, 2022). The dominant group derives material and psychological benefits from prejudice. Material benefits come in the form of intergenerational transfers of resources that are kept within a group; while psychological gains arise through the identification with certain groups. Thus, identifying with the dominant group gives someone a sense of entitlement for their supreme, absolute group positioning.

According to stratification economics, prejudice is instrumental for a dominant group toward maintaining its position, and as such it leads to purposeful discriminatory actions. Markedly, this runs counter to other theories of discrimination. For example, Allport (1954) proposes that racism is a result of irrational stereotypes about a marginalized group, while Akercelik and Kranton (2000) sees group identification stemming from cultural differences. Becker (1957) argues that discrimination stems from the dominant group having a ‘taste’ for their own race, and will therefore hire those within their race in the labor market. This approach comes close to the purposeful nature of discrimination according to stratification economics. But, the argument goes, firms choosing in this way will not be maximizing profits: as a consequence, discrimination will gradually fade away because of its inefficiency. On the other hand, Phelps (1972) and Arrow (1973) make the case that employers look at past statistics in the hiring process and since Black Americans have on average less education and employment opportunities, they will choose to employ white labor (statistical discrimination). Unlike in Becker (1957), statistical discrimination may very well be efficient if marginalized groups are in fact less educated/productive.

Importantly, stratification economics not only highlights the purposeful nature of discrimination, but also the material benefits that come with it. Discrimination allows flows of resources such as income, education, and health to be disproportionally higher for a dominant group. Likewise, stocks of resources such as wealth will become more unequal in favor of the dominant group as they accumulate over time. Our contribution is to model how the existence of (past or present) discrimination rooted in group conflict and asymmetric power accumulates into persistent inter-group inequality of income and wealth.

The beginning of stratification economics is associated with the contribution by William Darity Jr., where he describes the main tenets of the field (Darity, 2005). We outline them here: (i) intergenerational transfer of resources is the focus of inequality and power between
groups; (ii) material benefits to dominant groups incentivize them to continue their behavior; (iii) discrimination will likely persist; (iv) individuals in the marginalized group might attain high skills, but this does not mean they will automatically move to the dominant group; (v) some individuals might behave counter to the proliferation of their group identity, or ‘invest’ in the dominant identity, but even this will not be enough to stop discrimination.

In initiating the field, Darity (2005) also showed how insights from earlier scholars could be framed in the context of stratification economics (Darity, 2022). First, Veblen (1899) put forth the idea that people behave in emulation and comparison to one another. Between-group comparisons are the most important for the psychology of an individual, followed by within-group comparisons. Second, the notion of ‘psychological wage’ was coined by W.E.B. Du Bois (Du Bois, 1992) to describe the social advantages given to even the poorest white workers because of their skin color. Third, Eric Williams documents the beginnings of racism in America as a rationalization of slavery (Williams, 2021). In this case, discrimination is purposeful for its material benefits. Fourth, Blumer (1958) argues that racial prejudice is rooted in group positioning and the associated material advantages from this position. Fifth, Krueger (1963) extends the model by Becker (1957) to show that discrimination can still take place without a taste for it by the dominant group. In her model, white incomes are maximized with discrimination, but the sum of all incomes are smaller than without discrimination. A model which highlights the impact of endowments on the acquisition of socioeconomic resources is proposed by Becker and Tomes (1979). Sixth, Darity and Williams (1985) also show the persistence of racial inequality through the exclusion of marginalized groups in competitive markets. Our contribution owes much to ideas advanced by Sir Arthur Lewis, who describes intergroup discrimination as the conflict between competing and non-competing groups, as explained below (Lewis, 1985).

The rationality of discriminatory behavior stemming from group formation does not mean that all individuals in a dominant group will actively pursue discriminatory action. For one, groups are formed through discrimination because of economic benefits. This becomes so deeply engrained in society that it turns into an institutional feature: it becomes the norm. According to Social Dominance Theory (Sidanius and Pratto, 1999), institutional discrimination is solidified through ‘legitimizing myths.’ The dominant group maintains their power through the control over military, law, ideology, and discourse tools. Control allows them to legitimize, and dynamically change, the myths over time. As an example, the myth of racism in the US evolved from the belief about Black people having inferior physical and mental capabilities, to them having poor decision-making skills. Once myths are legitimized, most of the dominant group members do not even need to pursue active discrimination, but they will still receive the benefits so that discrimination will persist. The resulting inequality continues over time
and confers positive social values —better access to quality food, health, and education— to the dominant group in the process. The power of myths in society has been analyzed by institutional economists such as Dugger (1987) and Wrenn (2021), according to whom myths rationalize the social norms in society and can perform the role of maintaining the status quo. Myths allow the continuation of dominance by the top groups, and also justify the harm inflicted on some people required for such continuation.

The stratification economics literature is vast. For an extensive overview of the field see Darity (2005, 2022) and Chelwa, Hamilton, and Stewart (2022). Much of the research has to do with racial relations in the US, and for good reason; but it can be applied to group relations in any country where discrimination is present. Countries like Japan, Hungary, Brazil, India, and others have discrimination based on race, religion, caste, or class (Darity, 2022). Stratification economics could also be used to describe differences between countries and regions, which is related to the North-South dichotomy. Finally, the framework of stratification economics can also be applied to non-market economies, as illustrated in Darity (2001).

2 Some Stylized Facts

To set the stage, we identify some stylized facts about the persistence of inter-group inequality using data for the United States. Although purposeful discrimination in current times is not as explicit and of the same magnitude as it was in the past, its lasting effects can be seen in a variety of outcomes.

Figure 1 shows the difference in earnings across race for different levels of education and overall. Notice first that the Black population earns less regardless of education level. In particular, the racial divide in earnings even among individuals with an advanced degree appears to run counter to the theory of discrimination proposed by Fang and Loury (2005), who argue that discrimination is caused by some groups adopting behaviors that lead to them being unsuccessful. In fact, in 2020 the racial gap in average earnings is higher for those with an advanced degree than the whole-sample average: thus, investment in education does not close the earnings gap by race. Harrison (1972) recognizes that there are structural constraints that prevent African-Americans from reaching their full potential and that education alone will not solve this issue. Williams (1987) and Mason (1997) find empirical evidence that the wage differential between African-Americans and white Americans is not caused by skill differentials alone.

It is also true that there is a racial divide with regards to the college completion rate. Figure 2 shows the gap in educational attainment across races: the racial divide in high school completion has basically closed, but the percentage of white Americans who finish college is
Figure 1: Racial differential in mean earnings (1975-2020)

Notes: Data is from U.S Census (2021). We separate earnings by education level. Advanced degree refers to all degrees beyond a Bachelor’s. Total in tab (b) includes all education levels. The US Census did not separate Hispanics from Whites until 1993, and Asians from Whites in 2003. Therefore, the data is showing Black vs. non-Black population

roughly 10 percentage points higher than Black Americans for the year 2020. The gap shows no signs of closing as it is the same as it was in 1980 and larger than it was for 1960. We take the viewpoint that discrimination does play a role in educational attainment. One of our results is that, if an individual in the marginalized group expects that her returns to education are likely to be negatively affected by discrimination, she will be less likely to invest heavily in acquiring skills.

We will also show later in the paper that purposeful discriminatory effort aimed at maintaining a dominant position is wasteful from a societal standpoint, provided that the goal is to maximize income per capita. If this is the case, such inefficiency should reflect in some measure of wellbeing. Figure 3 shows a remarkably persistent—although partially closing—gap in life expectancy by race. There are of course many factors at play which are the direct cause of such gap, and they all boil down to discrimination in one way or another. Whether it be improper access to health care, misdiagnoses, more stress, or polluted communities, all of these are more likely to occur in the Black community and they stem from discrimination. James (1994) references the adverse effects of ‘John Henryism’ on the health of Black individuals. In the face of socioeconomic obstacles, African-Americans exert extreme efforts which can lead

\[\text{[1]}\]

Of course, our statements here and the results in the model below pertain to average outcomes. Disaggregation is likely to show that some marginalized individuals will in fact put more—not less—effort into skill acquisition, as is the case in Mason (1997), in order to offset the harm stemming from discrimination by the dominant group.
Figure 2: Racial differential in educational attainment (1940-2020)

Notes: Data from U.S. Census (2022). Data refers to the percentage of the population who have completed each respective level. The US Census did not separate Hispanics from Whites until 1993, and Asians from Whites in 2003. Therefore, the data is showing Black vs. non-Black population

... to chronic stress and various heart problems through their lifetime. It is also true that racial economic disparities will be reflected in differential effects from global health shocks such as COVID-19, because access to treatment and information are largely determined by wealth. In a study using data early in the pandemic (February 2020-July 2020), Basset et. al. (2020) found that Black Americans had significantly higher mortality rates compared to the non-hispanic white group, and that these disparities are consistent across all ages. For the non-hispanic white population, the mortality rate per 100,000 people was 36.7, while for non-hispanic Black was almost twice as high at 72.6. Out of the five racial groups in the study, mortality rates were highest for the non-hispanic Black population. We see closing the racial gap in life expectancy as a clear opportunity for a Pareto-improvement: better access to health care, more accurate diagnoses, pollution mitigation etc. can all happen without reductions in the welfare of other racial groups.

Lastly, racial wealth disparities are shown in Figure 4. Wealth accumulates over time, and due to past discrimination wealth is disproportionately accumulated by the white population. The per capita gap in wealth is almost $300,000 in the year 2019. Wealth is critical, as it is passed down generations and grants access to a variety of resources beneficial to wellbeing. Stratification economics points to the importance of wealth as the prime variable that determines the degree and source of power for the dominant group. The data could not be clearer about which group is dominant.
3 Outline of the Argument

In light of the literature and the stylized facts illustrated above, this paper aims to formalize some of the above main tenets of stratification economics in a simple equilibrium model based on group conflict and asymmetric power between groups. Our starting point is the summary of the arguments made in [Lewis, 1985] by [Chelwa, Hamilton, and Stewart, 2022], which also echo those found in [Darity, 2001, 2005]:

Consistent with sociologist Blumer’s [Blumer, 1958] perspective on group-based prejudice, stratification economics views race prejudice as largely a defensive reaction; a protective mechanism that is intentional in its preservation of social hierarchy. Prejudice works to enhance the relative position of the dominant group. Nobel Laureate Sir Arthur Lewis [Lewis, 1985], in his book *Racial Conflict and Economic Development*, described how dominant groups maintain their social hierarchy positioning by rendering subordinate groups noncompeting. He explains that in the pre-market stage, when individuals acquire skills and credentials to compete in the marketplace, the dominant group tends to use their power to limit subordinate group members access to such skills and credentials, so as to ultimately render them noncompeting at the market stage.

According to Lewis, when members from subordinate groups are able to overcome premarket barriers and become competitive, dominant groups deploy new strategies in a second stage, called the market stage. The first strategy in the market stage is to change the credentialing criteria so as to favor their own attributes
(a) Wealth Per Capita  (b) Wealth Gap

Figure 4: Racial Wealth disparities (1920-2019)

Notes: Data is from Derenoncourt et. al. (2022). Calculations from 1949-2019 are from the SCF+ database by Kuhn et al. (2020) and data prior to this are calculated by Derenoncourt et. al. (2022). Due to the extended time frame, the data is showing Black vs. non-Black population.

(i.e., changing the rules in the middle of the game); the second strategy is to simply discriminate against competing members of the subordinate group.

The Lewis conception of rendering groups competing and noncompeting presents discrimination as a strategic behavior with the intent to preserve group-based social hierarchy. Likewise, to the extent that individuals have agency in determining or codifying their group-based identity, they are incentivized to invest in that identity similar to how a firm is incentivized to invest in a particular input in their production process. Hence, as the social value (or market price) of a group-based identity like Whiteness rises, so will an individuals incentive to invest in that identity. Hence, stratification economics analogizes own group identity investment/divestment as a derived demand for the production of identity output itself, which garners economic return or sanction. (p.380)

Our goal is then to outline a simple model capturing the following basic aspects of stratification economics:

1. Discrimination is a purposeful activity pursued by dominant groups in order to maintain their status. Accordingly, dominant groups will be willing to spend effort in order to worsen the position of individuals in marginalized groups.

2. However, not every single member of the dominant group needs to be fully engaged in discriminatory behavior. A dominant-group member can benefit of discriminatory
activities by members of the same group, without having to necessarily discriminate. In other words, dominant-group members can free ride on past or current discriminatory activity by members of the same group and still improve their status over marginalized groups. Nevertheless, some discriminatory effort must have been spent for stratification to exist in society.

3. Marginalized groups have limited ability to counter discriminatory behavior. In other words, dominant groups exercise discriminatory power over marginalized groups, but the opposite is not true.

4. Discrimination not only leads to inequality, but is also wasteful from a societal standpoint, because it diverts resources away from maximizing a society’s average income. Yet, it persists because it is instrumental to the dominant group’s goal of maintaining its status, and because of imperfect and costly enforcement of anti-discriminatory practices. A corollary is that dominant groups will resist policies aimed at lessening the effects of discrimination, because such policies will make no difference in their absolute position but will reduce their relative advantage, given that they will only benefit marginalized individuals.

5. Through intergenerational bequests, racial income inequality translates into corresponding wealth inequalities across racial groups, i.e. stratification.

6. Finally, marginalized group members who have the means to do so can spend resources to ‘mitigate’ the effects of discrimination, or ‘invest in the dominant identity’ (passing) in order to reduce the harm caused by defensive/discriminatory activity by the dominant group. Both ways of countering discrimination are costly: therefore, they may at best lessen the effects of discrimination. Moreover, passing might be useful for some, but cannot be a viable strategy for the marginalized group as a whole.

To our knowledge, the model proposed in this paper is original, although the concepts are derived from [Lewis (1985)](https://doi.org/10.1086/259225) and [Darity (2001)](https://doi.org/10.1086/306570). Other theoretical models of stratification economics have been proposed in the literature, but they focus on somewhat different aspects than ours. In [Stewart (1997)](https://doi.org/10.1257/089533097550072410), racial identity is a commodity that is produced. Depending on the specific racial identity, externalities from this production can be positive or negative. A key aspect of this model is that when groups are formed, each group is incentivized to become the dominant one. [Darity, Mason, and Stewart (2006)](https://doi.org/10.1177/0891243606062883) use the tools of evolutionary game theory to analyze wealth accumulation and racial disparities. An individual can choose to maintain their race, switch racial identity, or become independent of race. The result is three possible equilibria, one where everyone is independent of race, one where everyone belongs to racial
groups, and a mixed one. Mason, Stewart, and Darity (2022) shows that group identities will influence accumulation and distribution of resources which create disparities in wealth. In turn, this wealth serves to reinforce group identities.

Conversely, we model the choice of skill acquisition through investment in ‘human capital’ in the non-market phase of the life of economic agents; skill acquisition determines the market income for the two groups of individuals. We assume that the dominant group has the power to restrict the ability to, or reduce the effectiveness of, the marginalized group’s investment in education, while the converse is not true. Our results correspond with the main tenets of stratification economics as outlined by Darity (2005). Equilibrium is characterized by persistent income inequality between the dominant and marginalized group. Such inequality is inefficient in the Pareto sense: a benevolent planner willing to maximize the society’s (net) market income would spend no effort in discriminatory activities. Yet, it is unlikely that such inefficiency will fade away on its own, because lessening or removing discrimination will make dominant groups lose their relative advantage, thus causing the groups’ resistance to any policy of such kind.

We then introduce anti-discriminatory enforcement measures, and carry a policy exercise in which the burden of proving discriminatory behavior falls upon individuals in the marginalized group. The main result of this exercise is that even in this case discrimination will not be completely removed, given both the cost of proving that discrimination has occurred, and the limited resources that are available to marginalized group members given the stratification-driven inequality in incomes. Finally, we embed the results of the analysis in a simple model if intergenerational altruism based on Galor and Zeira (1993) to provide a link from income to wealth inequality, and we discuss the role of reparations in this context.

An important caveat to the analysis below is that the model is constructed in order to generate a symmetric equilibrium, where all the individuals belonging to a certain group will make the same choice. This is desirable to keep the analysis as transparent as possible; but it comes at the price of ruling out the nuances of discrimination and individual responses to it. The result of a symmetric discriminatory effort across all individuals in the dominant groups allows us to focus on the average extent of discrimination and resulting group inequality in society, but it comes at the price of losing nuance about the fact that in reality some—hopefully many—individuals in the dominant group will not discriminate at all against marginalized individuals. In our model, every dominant individual will discriminate a little in equilibrium; while in real life many people will not discriminate but those who do will have a dispropor-

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2We also argue in Section 7.2 that the same exercise can be useful to think through marginalized individuals spending resources to mitigate the effects of discrimination, or the possibility of marginalized individual to invest in the dominant identity, or “pass.”
tionate effect on the outcomes of marginalized groups. Similarly, the fact that every individual in the marginalized group makes the same choice in equilibrium rules out the possibility that she in fact chooses to over-invest in skill acquisition relative to other marginalized individuals in order to overcome the aggregate effects of discrimination, as shown by Mason (1997). Once again, while these nuances are lost in our model, the focus on a symmetric equilibrium enables a transparent solution that is concerned with the average, rather than individual, outcomes shown in Figures 1 to 4.

4 Model: Setup

Consider a society composed of two groups, M (for marginalized) and D (for dominant). Individuals in both groups live for two periods: a pre-market period, when they invest in skills that determine their market income, and a market period, where their investment becomes income.

Importantly in what follows, an individual in group D can inflict economic harm by engaging in discriminatory activities against individuals in group M, but the reverse is not true. Discriminatory effort by group D-individuals has the goal of making M-individuals non-competitive in a market setting. Yet, D-individuals can benefit from discriminatory activity by members of the same group without having to bear the full cost of discriminatory action themselves. Given that what follows is a simple two-period model, we do not distinguish between whether discriminatory activity occurs in the pre-market or in the market stage: it features as a choice by dominant-group members that affects the market income of marginalized group members.

In order to gain intuition, we first present a baseline model where the dominant group has full discriminatory power over the marginalized group, or in other words there is no anti-discrimination effort; we then study a generalization of the model that can capture either a government engaging in anti-discriminatory policy, or marginalized individuals using their agency in order to counter the adverse effects of discrimination. The important point raised in the general model is that, if countering discrimination is costly for the marginalized group, group inequality will never be fully eliminated.

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3We do not explicitly model firm behavior in this paper: our framework models individuals as investing in skill acquisition in the non-market phase of their life to then run their own ‘small enterprises’ that generate market income in the second period.
4.1 Individuals in the Marginalized Group

An individual \( j = 1, \ldots, Q \) in group \( M \) chooses how much to invest in acquiring skills in the pre-market phase of her life in order to increase her income (become competitive) in the market phase. Market income is denoted by \( y_j^M \) and is a function of \( h_{j,M} \), which denotes effort provided in acquiring a marketable skill by individual \( j \) in group \( M \). However —and this is crucial— the \( M \)-individual’s market income can be affected by the total discriminatory effort \( d \in [0, 1] \) exerted by group \( D \). Thus, we postulate a function \( y_j^M(h_{j,M}; d) \) that describes the skill-acquisition technology for an individual in group \( M \) as a function of her own investment and the discriminatory effort by the other group. We make the following assumptions:

1. \( y_j^M(0, d) = 0 \) (No-free lunch).
2. \( \frac{\partial y_j^M}{\partial h_{j,M}} > 0 \) (Productive investment); \( \frac{\partial^2 y_j^M}{\partial h_{j,M}^2} < 0 \) (diminishing returns to skill acquisition).
3. \( \frac{\partial y_j^M}{\partial d} < 0 \) (Economic harm from discrimination).

To sharpen our conclusions, we assume the following Cobb-Douglas functional form:

\[
y_j^M(h_{j,M}, d) = Ah_{j,M}^\alpha (1 - d)^{1-\alpha} \quad \alpha \in (0, 1), \quad A \in (0, 1)
\]

(1)

where \( A \) is a positive productivity parameter, restricted for model consistency (see equation 11 below). We also postulate that individual \( j \) in group \( M \) begins her life with an endowment \( w_j^M \) of inherited wealth. Assume that decision-making in the pre-market stage of one’s life does not involve a decision on consumption and saving (more on this later). The total material resources available to an individual in group \( M \) through her life is therefore \( w_j^M - h_{j,M} + y_j^M(h_{j,M}; d) \) and what is basically equivalent to a participation constraint in contract theory requires that the income generated through human capital investment makes the person at least indifferent between investing or not. Thus, it must be true that

\[
w_j^M - h_{j,M} + y_j^M(h_{j,M}; d) \geq w_j^M
\]

(2)

which reduces to \( y_j^M \geq h_{j,M} \). The choice faced by individual \( M \) is therefore to invest in \( h_{j,M} \) to maximize her net material resources, \( y_j^M - h_{j,M} \). We find the following reaction function relating skill investment to discriminatory effort by the other group:

\[
h_{j,M}(d) = h_M(d) = (\alpha A)^\frac{1}{1-\alpha} (1 - d)
\]

(3)

which is equal across the \( j \) individuals in group \( M \) and linearly decreasing in \( d \) given the
assumption on technology: more discriminatory efforts by the dominant group reduce skill investments by the marginalized group members. This captures Lewis’s point about the ability of dominant groups to limit access by subordinate groups and ultimately make them non-competitive at the market stage; it also implies that discrimination can play a role in reducing educational attainment by marginalized groups.

The corresponding market income for an individual in group $M$ as a function of group $D$’s discriminatory effort is:

$$y^M_j(d) = y^M(d) = \alpha^{\frac{\alpha}{1-\alpha}} A^{\frac{1}{1-\alpha}} (1 - d)$$

By construction, every $M$-individual spends the same amount on skill-acquisition and earns the same income up to the total extent of discrimination by the dominant group.

### 4.2 Individuals in the Dominant Group

An individual $i = 1, \ldots, N$ in the dominant group is not discriminated against. Thus, under the assumption of no differences in talents between groups, the technology transforming skills $h_{i,D}$ into market income $y^D_i$ is simply $y^D_i(h_{i,D}) = Ah_{i,D}^{\alpha}$. The assumption of equal abilities across groups is important, because it allows us to focus on the adverse effects of discrimination on marginalized individuals by ruling out the unnecessary (and implausible) complications that would arise by assuming group-specific differences in the productivity of human capital investment. We now turn to the free-riding issue in discriminatory activity, and suppose that total discriminatory effort by group $D$ is a weighted average of the discriminatory effort by its members. In particular, we assume that

$$d \equiv \eta d_i + (1 - \eta)d_{-i} \quad \eta \in (0, 1)$$

with the usual game-theoretic notation: $d_{-i} \equiv \frac{\sum_{q \neq i} d_q}{N-1}$, the average discrimination effort by the non-$i$ individuals. The assumption of free-riding by dominant group members implies that they have privilege because of their belonging to the group, independent of their attitudes toward the marginalized group, i.e. whether they are explicitly or implicitly biased or even allies of the marginalized. This is because $D$-group members benefit from the current or past discrimination that has favored them in society.

We also assume that the individual cost of discriminatory action is convex: $c(d_i) = d_i^2 / 2$, to synthetically capture that explicit discriminatory actions are increasingly costly for dominant-group individuals, given that blatant discrimination will be likely subject to social or legal sanctioning while more subtle discrimination may not be. Individual $\{i, D\}$ chooses $h_{i,D}$ and
so as to maximize her position relative to a $M$-individual, which we capture through assuming that she maximizes the *difference* between her market income and the average $M$-person market income. This captures the point that discrimination is aimed at creating or perpetuating the dominant group’s economic advantage. It will imply that, in equilibrium, dominant group members will earn higher income over members of marginalized groups despite equal productivity parameters $A$ across groups.

The problem faced by an individual in group $D$ is: given $d_{-i}, h_M$,

$$\max_{\{h_i,D,d_i\}} \left[ y_i^D(h_i,D) - y_i^M(h_M,d_i;d_{-i}) \right] - h_i,D - c(d_i) \quad (6)$$

The choice of investment in skill acquisition gives:

$$h_{i,D} = (\alpha A)^{\frac{1}{1-\alpha}} \quad (7)$$

while the extent of discriminatory effort as a function of marginalized individuals’ income and the total discriminatory effort by the dominant-group is\footnote{Of course, the term \(d\) in the RHS of equation (7) includes the individual effort by the $i$-th individual in group $D$. But given our focus on a symmetric equilibrium, writing the dominant-individual’s reaction function in this way makes it more transparent.}

$$d_i(h_M,d) = \eta(1-\alpha)Ah_M^\alpha(1-d)^{-\alpha} \quad (8)$$

Note that the choice of discrimination effort increases in the productivity parameter $A$. The implication is that the dominant group must allocate more discriminatory effort as the members of the marginalized group become more productive. Accordingly, the model predicts that efforts toward racial stratification increase as the productivity—or, more generally, the prominence—of the marginalized group increases\footnote{This point would become even more forceful if we introduced group-specific productivity parameters: an assumption that, as already argued, appears hard to defend.}

5 Equilibrium

An equilibrium consists of choices $\{h_{j,M}\}_{j=1}^{O}$ that maximize the net material resources for all $j$ individuals in group $M$ given $d$, and choices $\{h_{i,D},d_i\}_{i=1}^{N}$ that maximize the difference in net material resources between each $i$-individual in group $D$ and the average $M$-individual, given $d_{-i}$ as defined above. We begin by characterizing the equilibrium discriminatory effort.
by $D$-individuals. Plugging equation (3) into (8), we find
\[
d_i^E = d^E = \eta \left(\frac{1 - \alpha}{\alpha}\right) \left(\alpha A\right)^{\frac{1}{\alpha - 1}}
\]
equal across all individuals in group $D$: this is the reason why we refer to the equilibrium of the model as being symmetric. The extent of discriminatory effort is equal to a fraction $\eta(1 - \alpha)$ of their equilibrium market income $y^{E,D}$, given that
\[
y^{E,D} = \alpha \left(\frac{\alpha}{1 - \alpha}\right) A^{\frac{1}{\alpha - 1}}
\]
The equilibrium value of skill investment by group $M$ is found inserting (8) into (3) using the fact that $d_i = d \forall i$, and is given by:
\[
h_M = \left(\alpha A\right)^{\frac{1}{\alpha - 1}} \left[1 - \eta \left(\frac{1 - \alpha}{\alpha}\right) \left(\alpha A\right)^{\frac{1}{\alpha - 1}}\right]
\]
We can then calculate the two groups equilibrium incomes and the extent of market income inequality due to active discriminatory practices by simply inserting in the choices of $h_M$, $h_D$, and $d$ from equations (3), (7), (8). For an individual in group $M$, equilibrium market income is given by:
\[
y^{E,M} = \alpha \left(\frac{\alpha}{1 - \alpha}\right) A^{\frac{1}{\alpha - 1}} \left[1 - \eta \left(\frac{1 - \alpha}{\alpha}\right) \left(\alpha A\right)^{\frac{1}{\alpha - 1}}\right]
\]
Therefore, equilibrium income inequality between individuals in the two groups, measured as the ratio $y^{E,D}/y^{E,M}$, is:
\[
\frac{y^{E,D}}{y^{E,M}} = \frac{1}{1 - \eta \left(\frac{1 - \alpha}{\alpha}\right) \left(\alpha A\right)^{\frac{1}{\alpha - 1}}} > 1
\]
Two observations are in order: first, absent equilibrium discrimination there would be no inequality between groups. This is a consequence of the assumption of equal productivity of human capital investment if not for the discriminatory effort exerted by the dominant group. Second, the possibility of free-riding on other $D$-individuals’ discriminatory effort plays a role in the model, despite the symmetric result: if all $D$-individuals “internalized” the benefit they receive in terms of higher incomes than the $M$-individuals despite equal abilities, the average discriminatory effort exerted in society would actually be higher.\footnote{This is easily verified by solving the $D$-individual maximization problem under the constraint that $d_i = d_{-i} = d$, or equivalently setting $\eta = 1$ so that the entire responsibility of discrimination falls upon the $D$-group individual. Thus, despite the symmetric equilibrium, the possibility of free-riding on other people’s discriminatory effort reduces the total amount of discrimination in the model. While it would be more realistic to have a very}
6 Welfare

Consider the choice of \( \{h_M, h_D, d\} \) by a benevolent planner that aims to maximize the society’s net average material resources

\[
y \equiv \frac{1}{N + Q} \left\{ \sum_{j=1}^{Q} (y_j^M - h_{j,M}) + \sum_{i=1}^{N} [y_i^D - h_{i,D} - c(d_i)] \right\}
\]

taking into account that all \( M \)-individuals choose the same amount of investment in skill acquisition, and that \( D \)-individuals allocate the same amount of effort to discrimination as well as skill acquisition. Defining \( \mu \equiv Q/(N + Q) \) as the share of the marginalized group in the economy’s given population, it is easy to verify that the corresponding average market income \( y \) is monotonically decreasing in the discriminatory effort \( d \):

\[
y = \mu [Ah_M^\alpha (1 - d)^{1-\alpha} - h_M] + (1 - \mu) \left[ Ah_D^\alpha - h_D - \frac{d^2}{2} \right]
\]

with \( \partial y/\partial d < 0 \) always

which implies that a planner acting with the goal of maximizing the average societal net income will choose to allocate no resources to discriminatory activities. Consequently, the welfare-maximizing solution involves allocating the same amount of investment for the two groups: \( h_{D}^* = h_{M}^* = (\alpha A)^{\frac{1}{1-\alpha}} \). It is also egalitarian: \( y^{*D}/y^{*M} = 1 \).

Thus, our analysis confirms the wasteful nature of discrimination, given that it diverts resources from otherwise productive activities. The implication is that racial inequality stemming from purposeful discriminatory effort is also inefficient, if the goal is to maximize a society’s standard of living, and this runs counter to the possibility of efficient statistical discrimination in Phelps (1972) and Arrow (1973). However, and differently from Becker (1957), the inefficiency will not go away on its own, given that it stems from the dominant group’s goal of maximizing its members’ dominant position in the society. A further consequence of this result is that dominant groups may in fact resist policies aimed at achieving the socially desirable outcome of racial equality—because such policies will determine a loss in relative terms—even though such policies come at no absolute cost for them. In fact, any Pareto-improvement in this model will only benefit only marginalized groups without producing any effect on dominant

The same conclusion would be true if the welfare function was multiplicative instead of additive, with geometric weights \( \mu \) and \( 1 - \mu \) for the two groups respectively.
group members. The consequent loss of economic status—and the political power that comes with it—may produce resistance to policies aimed at mitigating racial disparities.\footnote{This argument paraphrases \cite{Kalecki1943}, who argued that capitalist firms may resist full-employment policies because of their effect of raising wages and therefore improving the bargaining position of workers in the economy.}

In our model, like \cite{Krueger1963}, overall incomes will be higher when there is no discrimination. One difference is that we find that costly discrimination effort leads to a reduction in the dominant group’s net lifetime income; but the dominant group’s market income is higher than the marginalized group’s market income. In \cite{Krueger1963}, on the other hand, white incomes are maximized with discrimination. Although the two models rely on a different set of assumptions, this difference rests on the fact that the purpose of discrimination is to maintain dominance by maximizing the group’s status in society, and this results in the dominant group having more resources than the marginalized group. Moreover, our focus is on aggregate outcomes, but in real life certain individuals are likely to enjoy some absolute gains from discrimination.\footnote{Note further that \cite{Krueger1963} separates each racial group into capitalists and workers. The individuals that gain from discrimination are the white workers, while white capitalists see a drop in their incomes. Our expectation is that there are more nuances to this framework. Some white workers and some white capitalists might end up being richer, but also some people from these same two groups will be poorer from choosing to discriminate.}

\section{Anti-Discrimination Policy}

In principle, the efficient allocation involving no discrimination could be achieved by introducing policies that make it more difficult for the dominant group to inflict economic harm to the marginalized group, thus lessening the strength of discriminatory efforts by group $D$. For example, with anti-discrimination effort by the government taking a value of $\varepsilon \in [0, 1]$, the market income of an individual in group $M$ becomes $y^M = Ah^\alpha_M [1 - d(1 - \varepsilon)]^{1 - \alpha}$, which eliminates the economic effects of discrimination when $\varepsilon = 1$. However, anti-discrimination policies are never fully enforced in real life, and this is enough for discrimination to persist in society. For now, assume $\varepsilon \in (0, 1)$: we will show below that there are economic reasons to expect that anti-discrimination efforts will fall short of removing inequality.

The reaction function by group $M$ now involves the enforcement effort $\varepsilon$:

$$h_M(d; \varepsilon) = (\alpha A)^{\frac{1}{1-\alpha}} [1 - d(1 - \varepsilon)]$$  \hspace{1cm} (15)
and the market income for an individual in group $M$ is

$$y^M(d; \varepsilon) = \alpha \frac{\alpha - 1}{\alpha - 1} A^{\frac{1}{\alpha - 1}} [1 - d(1 - \varepsilon)]$$  \hspace{1cm} (16)$$

The problem solved by a group-$D$ individual becomes: given $d_i, h_M, \varepsilon$,

$$\max_{\{h_i, D, d_i\}} \left[ y^D(h_i, d) - y^M(h_M, d_i; d-\varepsilon) \right] - h_i, D - c(d_i)$$  \hspace{1cm} (17)$$

and yields the following choice of discriminatory effort:

$$d_i = \eta (1 - \alpha) Ah_j^{\alpha} M [1 - d(1 - \varepsilon)]^{-\alpha} \forall i \in D$$  \hspace{1cm} (18)$$

Accordingly, in equilibrium we have that group $D$’s income is the same as in equation (10), and that the total discriminatory effort by group-$D$ members is also given by equation (9) above. Equilibrium market income for an individual in group $M$ will be:

$$y^{E,M}(\varepsilon) = \alpha \frac{\alpha - 1}{\alpha - 1} A^{\frac{1}{\alpha - 1}} \left[ 1 - (1 - \varepsilon)\eta \left( \frac{1 - \alpha}{\alpha} \right) (\alpha A)^{\frac{1}{\alpha - 1}} \right]$$  \hspace{1cm} (19)$$

and market income inequality is given by:

$$\frac{y^{E,D}}{y^{E,M}(\varepsilon)} = \frac{1}{1 - (1 - \varepsilon)\eta \left( \frac{1 - \alpha}{\alpha} \right) (\alpha A)^{\frac{1}{\alpha - 1}}}$$  \hspace{1cm} (20)$$

which of course reduces to perfect equality under $\varepsilon = 1$, that is under full enforcement of anti-discriminatory measures.

### 7.1 Costly Enforcement

A reasonable question to ask, then, is why anti-discriminatory measures are not fully enforced. A plausible answer may be that it is costly to do so, especially if the group (or individual) that is discriminated against has to incur the legal or bureaucratic costs of proving that there was discrimination against herself or her group’s members. Suppose that group $M$ bears the cost (for example, the burden of the proof in legal cases) of ensuring enforcement, and suppose that such cost is strictly convex: $c(\varepsilon) = \varepsilon^2 / 2$. A group $M$-individual will now solve:

$$\max_{\{h_M, \varepsilon\}} Ah_j^{\alpha} M [1 - d(1 - \varepsilon)]^{1-\alpha} - h_j, M - c(\varepsilon)$$  \hspace{1cm} (21)$$
The choice of $h_{j,M}$ is as per equation (15) above. On the other hand, the first-order condition on the choice of anti-discrimination effort gives:

$$\varepsilon = (1 - \alpha)Ah_{j,M}^\alpha [1 - d(1 - \varepsilon)]^{-\alpha}d$$

which, using (15) and (18) gives:

$$\varepsilon = \eta(1 - \alpha)^2\alpha^{2\alpha} A^{2/\alpha} \propto d^2$$

(22)

that is proportional to $d^2$. Since $d \in (0, 1), \eta \in (0, 1)$, the result is that $\varepsilon < d$: that is, if the burden of proving discrimination is costly for those who are discriminated against, discrimination will never be completely eliminated. It is also worthwhile reiterating that the threat of losing relative ground for dominant-group members will act toward resisting any policy change aimed at lessening racial inequality. This will happen because the partial or complete elimination of the effects of discrimination only benefits the marginalized group, and therefore it implies that $D$-individuals will see their relative position in society worsen, even though their absolute position remains intact.

A possible way to ensure greater anti-discrimination enforcement could be to subsidize such efforts by marginalized group members, in order to lessen the costs associated with burden of proving that discrimination has in fact happened. There are two kinds of issues with such a policy, though: on the one hand, given the—exorbitant for many—costs of legal action, such a subsidy would be more effective if given in advance: but of course there is no guarantee that the legal action will be successful for the plaintiff. On the other hand, there is the problem for the government authority to collect revenues, i.e. taxes, to pay for such subsidies. Both problems point to the difficulty in lessening the costs associated with the burden of the proof by plaintiffs in a court asked to judge on discriminatory action.

### 7.2 Agency; Investing in the Dominant Identity

The same setup advanced in the previous subsection can be used to think through the possibility that marginalized individuals may in fact use their agency to mitigate the adverse effects of discrimination, or to ‘pass’ as members of the dominant group through investment in the dominant identity. The important point here is that both kinds of actions will be costly for marginalized group members, with the implication that it is unlikely that they will be enough to erase the effects of discrimination. Starting with the ‘passing’ issue, the focus of this analysis is on aggregate outcomes, so our setup will generate a fraction $\varepsilon$ of the marginalized group as a whole that is attempting to pass as dominant. Darity (2022, p. 18) argues that “A social group,
collectively, cannot gain the prerequisites of a dominant social group merely by adopting their behaviors.” In order for group passing to be successful, there needs to be a prior change to the material, political, or economic conditions of the group. An example of this is Sanskritization (Srinivas, 1956), which describes the process of mobility within the Hindu caste system. Upward movements in the social ladder for a specific caste or outside group is successful when the social conditions of that group change, like the need for a specific type of labor or new found trade opportunities. Sanskritization shows that under a stratified society a marginalized group is unlikely to to become dominant by attempting to pass.

Of course, ‘passing’ can be successful at the individual level. However, even though this can help the individual overcome disadvantages and achieve material benefits, such cases are relatively rare. Stratification economics explains that they do not occur as often as one would expect because: (i) a marginalized individual needs the proper dominant-group characteristics; (ii) there is a risk of being caught; (iii) the individual will lose the community they are accustomed too; (iv) they might receive sanctions from their previous group; and (v) many marginalized individuals are not okay with taking the side of their oppressors (Darity, 2022).

In our stylized framework, all of these challenges are subsumed in the cost of investment in the dominant identity. In any event, for all these reasons passing as dominant —be that at the group or individual level— cannot be considered a viable strategy to overcome group discrimination.

But individually taking up the responsibility of mitigating the effects of discrimination is also costly. For example, calling out colleagues or supervisors in the workplace for discriminatory actions will result in conflicts that will affect the entire work environment; but one can also think of the time-burden of amassing evidence in order to argue that discrimination has in fact taken place, which is similar to having the burden of the proof in legal cases. Likewise, mitigating the effects of discrimination through “over-excelling” in school or at work will be costly. Skipping lunch breaks at work or spending all of one’s free time studying for classes involves the opportunity cost of missing out on socialization or exercise, for example.

Thus, the framework is quite general in that it encompasses a variety of costly actions that marginalized individuals can take in order to lessen the effects of discrimination. In all of these cases, it is unlikely that such efforts will be enough to eliminate discrimination altogether.

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10 An additional consideration involves the possibility of individuals in either group spending resources in order to improve their relative status within their group. Within the M-group, this issue is conceptually analogous to passing, and it could be modeled disaggregating the effort spent in reducing the income gap with the dominant group. The result would be within-group inequality among marginalized individuals. Similar considerations apply to dominant group members who choose to invest resources in order to position themselves above their group average or median.
8 Wealth Inequality

If members of the two groups end up with unequal incomes because of the presence of discrimination in equilibrium, it is to be expected that such inequality will reverberate into wealth disparities and end up stratifying the society by race. Let us make this point in a very simple intergenerational altruism framework adapted from Galor and Zeira (1993). An individual in group \( r = \{M, D\} \) earns a lifetime income \( Y^r \) which is net of the investment in skill acquisition (and of the amount of discriminatory effort for dominant-group members); and has utility defined over consumption \( c_r \) and bequests \( b_r \): 

\[
u_r (c_r, b_r) = \beta \ln c_r + (1 - \beta) \ln b_r, \beta \in (0, 1).\]

Every individual has one parent and one child, so that population is constant and there is no issue of allocating bequests among several children. Since the utility function is Cobb-Douglas, the allocation of consumption and bequests is given by constant fractions of the net income for each individual:

\[
c_r = \beta Y^r \quad \text{(23)}
\]

\[
b_r = (1 - \beta) Y^r \quad \text{(24)}
\]

If parents earn interest \( \rho_t \) on the fraction of lifetime income they choose not to consume, the wealth inherited by an individual in the non-market stage of her life is nothing but the amount bequeathed by her parents times the interest factor \( 1 + \rho_t \). Accordingly, we find the following equation tracing the evolution of wealth for individuals in group \( r = \{M, D\} \):

\[
w^r_{t+1} = (1 - \beta) Y^r_t (1 + \rho_t) \quad \text{(25)}
\]

which compounds over time due to the role of interest income. Appendix A calculates the difference in lifetime incomes between the two groups. Accordingly, in the simplest case with no anti-discrimination policy/effort, the racial wealth gap evolves as follows:

\[
w^D_{t+1} - w^M_{t+1} = (1 - \beta) (Y^D - Y^M)(1 + \rho_t)
\]

\[
= (1 - \beta) \left[ \frac{\eta(\frac{1-\alpha}{\alpha})(\alpha A)^{\frac{r-n}{2}}}{2} \right] \left[ \frac{2}{\eta - 1} \right] (1 + \rho_t) \quad \text{(26)}
\]

which compounds over time even with a stationary income difference —as is the case in our model— due to the role of interest income. Thus, even our simple model delivers a growing racial wealth gap despite a stationary racial income difference and identical rates of return to wealth across races. With time-varying racial inequality and race-specific rates of return (see Petach and Tavani 2021), the racial wealth gap is bound to be much larger than what implied.
by our model. As such, our results should be considered as providing a theoretical lower bound on the racial wealth gap.

8.1 Reparations

The simple wealth inequality framework above can be used to analyze the effects of reparations to the marginalized group. Reparations have been proposed as a potential solution for group-based inequality (Darity and Mullen, 2020). For our purposes, it is simplest to assume that reparations \( R \) are given to an individual in the marginalized group during the market stage of their life, and are paid for by taxing dominant group members.

We also need to take into account the fact that different groups have different population sizes, and therefore different shares of the total population. Assume that an individual in the dominant group is taxed by an amount \( T \). Given our assumption that the total population is constant, we can normalize it to one, and use the population shares of the marginalized (\( \mu \)) and dominant group (\( 1 - \mu \)) as we did in the planner’s problem above. For the government to run a balanced budget, it must be the case that \((1 - \mu)T = \mu R\), so that the “reparation tax” for an individual in group \( D \) is \( T = \mu R / (1 - \mu) \).

The evolution of wealth for the two groups is now described by the following two equations:

\[
\begin{align*}
    w_{t+1}^M &= (1 - \beta)Y^M(1 + \rho_t) + R \\
    w_{t+1}^D &= (1 - \beta)Y^D(1 + \rho_t) - \frac{\mu}{1 - \mu}R
\end{align*}
\]  

(27)  

(28)

And a policymaker may want to choose \( R \) so as to achieve \( w_{t+1}^M = w_{t+1}^D \). The solution is (see Appendix A for a derivation of the racial income gap \( Y^D - Y^M \)):

\[
R = (1 - \mu)(1 - \beta)(1 + \rho_t)(Y^D - Y^M)
\]

\[
= (1 - \mu)(1 - \beta)(1 + \rho_t) \left\{ \frac{[\eta(1 - \alpha)(\alpha A)^{1 - \alpha}]^2}{2} \left[ \frac{2}{\eta} - 1 \right] \right\}
\]  

(29)

The amount of reparations increases: (a) in the size of the dominant group \( (1 - \mu) \); (b) in the bequest motive \( (1 - \beta) \); and (c) in the amount of discrimination chosen by the dominant group (the first term in braces). It must be noted that this value for reparations is the one that closes the racial wealth gap for the current generation. However, the relatively simple expression in equation (29) can be complicated a little by considering that a policymaker may (and in fact should) want to keep track of previous inequities up to a certain time zero. Accordingly, it should choose a total amount of reparations given by:
\[ R_t = (1 - \mu)(1 - \beta) \left\{ \left[ \eta \left( \frac{1 - \alpha}{\alpha} \right) \left( \frac{1}{\eta} \right) ^2 \right] \left( \frac{2}{\eta} - 1 \right) \right\} \sum_{q=0}^{t-1} (1 + \rho_q)^q \]  

(30)

Note that this formula is particularly simple because it involves the constant racial lifetime income gap found above, a constant bequest fraction, and equal rates of return across groups. 

Petach and Tavani (2021) have shown that white households earn rates of return that are one to four percentage points higher than Black households; and that about half of the difference cannot be explained by observable characteristics. Differential rates of returns by race will compound the effect of racial income inequality, thus increasing the racial wealth gap.

We conclude this Section by noting that the presence of a ‘reparation tax’ paid for by the dominant group members amplifies the problem already discussed above in regards to the resistance by dominant groups to addressing racial inequality. We already discussed the problem arising with the fact that any Pareto-improvement in this model will only increase the income of the marginalized group, while leaving the dominant group’s income unchanged. It is to be expected that D-group individuals will be reluctant to sign off on policies that reduce their advantage over M-group individuals. Even more so in the context of wealth accumulation and stratification by race, D-group individuals will resist paying a reparation tax in order to reduce or eliminate the racial wealth gap.

The result in equation (30) points to the importance of compound interest and the passing of time in determining the amount of reparations needed in order to suppress the racial wealth gap. Given the exponential nature of the latter, as exemplified in Figure 4 above, the more society waits to address the issue the more costly reparations will be.

9 Conclusion

A central aspect of stratification economics is that it grounds racial inequality in group conflict and active discriminatory behavior by dominant group members. This paper is an attempt to formalize this insight and its consequences in an equilibrium model of competing and non-competing groups similar to Lewis (1985). First, even though there are incentives for individuals in dominant groups to free ride on discriminatory effort exerted by other dominant individuals, someone must have discriminated, otherwise discrimination would not exist: our framework is constructed to deliver a symmetric extent of discriminatory effort across all D-individuals. Second, the extent of discriminatory effort will increase in the productivity of marginalized individuals. Third, and consistently with the data presented in Figure 2, the higher the extent of discriminatory effort against them, the less marginalized individuals will rationally choose on average to invest in skill acquisition. Fourth, discrimination is societally inefficient,
but it won’t necessarily be removed because it serves the purpose of maintaining the domi-
nant group’s relative position. As a corollary, dominant groups will resist anti-discrimination
policies, because even though their absolute position will remain unchanged because of such
policies, they will lose ground in relative terms. Fifth, anti-discrimination measures can lessen
the negative effects of discrimination, but will not be enough to eliminate them if the burden of
proving discrimination falls upon the discriminated. Finally, group income inequality arising
from discrimination will translate into a racial wealth gap through intergenerational altruism.

There are several simplifying assumptions that are made in this paper in order to keep the
analysis as simple and transparent as possible. First, we simply assumed a given power struc-
ture in the economy, without explaining its origin or evolution. We think that this assumption is
appropriate, given the colonial and slavery-related origins of white dominance in the Western
world. Moreover, this assumption is reflective of the current inequalities in the economic and
wellbeing outcomes by race. Second, by construction we did not consider the possibility that
individuals in either group will tap into their existing wealth in order to fund their skill acqui-
sition. Given the persistence and magnitude of the racial wealth gap, it is likely that explicitly
introducing wealth in the investment resource constraint actually amplifies our conclusions,
rather than lessening them. Thus, in this respect our model can be seen as providing lower-
bound considerations on the role of group conflict in stratifying the society by race. Third, and
again with the purpose of providing a simple microeconomic model that can nevertheless be
easily aggregated, we made a series of assumptions that deliver a symmetric equilibrium out-
come. For example, the weight placed on individual discriminatory effort by dominant-group
members is assumed to be the same across all $D$-individuals ($\eta = \eta_i \forall i \in D$): this allows for
a symmetric equilibrium solution, but it is obviously an oversimplification of reality. Fourth,
and in order to emphasize the role of discrimination instead of other factors, we assumed no
productivity differences across individuals. While we do not believe that there are systematic
(and exogenous) differences in productivity across races, different individuals may be have
different abilities in turning their educational investment into market incomes, irrespective of
whether they belong to the dominant or the marginalized group. Fifth, we considered only
explicit discriminatory efforts by dominant group members, abstracting from more nuanced
ways of discriminating against marginalized groups such as voting behavior, for example. A
more sophisticated model would consider $M$-group members electing politicians that enact
legislation maintaining the status quo in terms of group inequality. Sixth, we did not consider
the possibility that relative positioning also happens within groups. In this case, there would be
not only inequality between the two groups, but also within-group inequality.

As stylized as it is, however, we believe that our model can provide a useful attempt to for-
mally address the issues arising with stratification as the outcome of group conflict and power,
and its implications for income and wealth inequality. Efforts directed to addressing these limitations appear to be fruitful areas for further research on modeling stratification economics.

References


A Calculating the lifetime income gap

We start from the difference between the lifetime income of $D$-individuals $Y^D$ and the lifetime income of $M$-individuals $Y^M$, evaluated at an equilibrium allocation:

$$Y^D - Y^M = y^D - h^D - c(d) - [y^M - h^M]$$

$$= \alpha \frac{1}{\alpha - \alpha} A \frac{1}{\alpha - \alpha} - \left( [\alpha \frac{1}{\alpha - \alpha} A \frac{1}{\alpha - \alpha} - \eta \left( \frac{1}{\alpha} \right) (\alpha A) \frac{1}{\alpha - \alpha} \right) - \left( [\alpha \frac{1}{\alpha - \alpha} A \frac{1}{\alpha - \alpha} - \eta \left( \frac{1}{\alpha} \right) (\alpha A) \frac{1}{\alpha - \alpha} \right)$$

Combining like terms we are left with:

$$Y^D - Y^M = - \left[ \eta \left( \frac{1}{\alpha} \right) (\alpha A) \frac{1}{\alpha - \alpha} \right]^2 + \alpha \frac{1}{\alpha - \alpha} A \frac{2}{\alpha - \alpha} \eta \left( \frac{1 - \alpha}{\alpha} \right) - \alpha \frac{2}{\alpha - \alpha} A \frac{2}{\alpha - \alpha} \eta \left( \frac{1 - \alpha}{\alpha} \right)$$

We can simply further as follows:

$$Y^D - Y^M = (\alpha A) \frac{2}{\alpha - \alpha} \eta \left( \frac{1 - \alpha}{\alpha} \right) \left[ \frac{1}{\alpha - \alpha} - \frac{\eta \left( \frac{1 - \alpha}{\alpha} \right)}{2} - 1 \right]$$

$$= (\alpha A) \frac{2}{\alpha - \alpha} \eta \left( \frac{1 - \alpha}{\alpha} \right) \left[ \frac{1 - \alpha}{\alpha} - \frac{\eta \left( \frac{1 - \alpha}{\alpha} \right)}{2} \right]$$

$$Y^D - Y^M = \left[ \eta \left( \frac{1}{\alpha} \right) (\alpha A) \frac{1}{\alpha - \alpha} \right]^2 - \frac{2}{\eta - 1} \left[ \frac{2}{\eta} - 1 \right] = d^2_2 / 2 \left[ \frac{2}{\eta} - 1 \right] = c(d_E) \left[ \frac{2}{\eta} - 1 \right]$$

which is the term in braces in equations (29) and (30) in the text. Since $\eta \in (0, 1)$, the racial income gap will be positive and increasing with discrimination effort $d$ as it is intuitive.