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SEGREGATED SCHOOLS AND THE MOBILITY HYPOTHESIS:
A MODEL OF LOCAL GOVERNMENT DISCRIMINATION

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ABSTRACT

Around the turn of the century, Southern blacks lost the right to vote and discrimination against them by local government officials intensified. This paper argues that, in the case of the de jure segregated public schools attended by black children, the ability of Southern blacks to "vote with their feet" placed limits on local government discrimination.

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I. MYRDAL'S PARADOX

Between 1890 and 1910 Southern blacks were disenfranchised at the state and local level by selective enforcement of existing legislation, new suffrage restrictions, massive electoral fraud, and violence. Over the same period, expenditures per black pupil in the South's de jure segregated black public schools declined sharply relative to expenditures per white pupil. This coincidence, according to contemporary observers and modern historians, was not accidental. Stripped of the vote, Southern blacks lost an indispensable weapon in their battle against government discrimination.¹

As compelling and widely believed as the disenfranchisement thesis is, it is seriously incomplete. It is true that, ca. 1910, Southern school officials spent roughly 40 cents per black pupil in average daily attendance for every dollar spent on white children, and in doing so, were violating the "separate-but-equal" doctrine as established by the Supreme Court in its 1896 decision, Plessy v. Ferguson.² But why weren't the violations of separate-but-equal worse, once black voters were disenfranchised? Why did school officials, who were white, allocate funds to the black public schools at all? "[T]he great wonder," wrote a puzzled Gunnar Myrdal [1944, p. 888] "is that ... the Negroes' right to public education was not renounced altogether. But it did not happen."

This paper offers a novel answer, one related to the key

proposition of local public finance, the Tiebout hypothesis [Tiebout, 1956]. Although black parents could not vote at the ballot box, they could, and did, vote with their feet in search of schools for their children. Competition for black labor helped limit the violations of separate-but-equal in the absence of voting rights. Exit, in the case of segregated schools, was a partial substitute for political voice.

Section II of the paper formalizes these notions in a simple model of local government discrimination. The model generalizes an early analysis of Kreuger's [1963], by allowing for local government expenditures and minority mobility across jurisdictional boundaries. Empirical evidence of the model's applicability in the case of segregated schools is presented in sections III. The paper concludes by placing its arguments in the context of previous solutions to Myrdal's paradox.

II. A MODEL OF LOCAL GOVERNMENT DISCRIMINATION

"Our ignorance of the scope and incidence of collective action against minorities is perhaps the most important remaining gap in the analysis of the economic position of minorities."

--Becker [1971, p. 8]

Economists have devoted considerable attention to modelling discrimination by private agents, but have been less interested in the formal analysis of discrimination in the public sector.

Perhaps the major exception is Kreuger [1963]. In Kreuger's model, members of a majority group levy an optimal tax on a disenfranchised minority. The objective is to maximize the aggregate income of the majority, with the size of tax depending on certain exogenously specified elasticities of factor demand and supply.

Although Kreuger's model provides valuable insights, it is not directly applicable to Myrdal's paradox for two reasons. First, Kreuger does not explicitly model government expenditures on a good consumed by minority households. Second, the ability to escape the tax by leaving the jurisdiction is not considered. This section amends Kreuger's model to include both government expenditures and the possibility of minority exit.

To fix ideas, suppose there are two groups, W and NW, and $j = 1, \dots, J$ geographically distinct communities which are a subset C_j of a larger set C (for example, a state). In each community members of W combine NW labor L_j with a factor K_j to produce a single, homogenous output Q_j according to a constant returns production function: $Q_j = F(L_j, K_j)$. The aggregate amounts of K and L in C_j , \underline{K} and \underline{L} , are fixed. Each community has the same share of the aggregate amount of \underline{K} , \underline{K}/J .

The objective of NW households is to choose a community which maximizes their utility, $V(w_j - t_j, g_j)$, where g_j is a normal good (for example, education) supplied by the local government controlled by members of W. The function V is assumed to be same for all households. The total cost of supplying g_j units is

pgL_j . The production of g_j is financed by a lump sum tax t_j on w_j .³

I also assume that NW households are costlessly mobile across community boundaries, but only among communities in C_j . A reduction in mobility costs is modelled as an increase in J . "Perfect" mobility is the limiting case as J goes to infinity.

Aggregate income Y_j of the W group in community j is:

$$(1) \quad Y_j = F(L_j, K_j) - w_j L_j + S_j$$

where $S_j = t_j L_j - pg_j L_j$. As in Kreuger's model, government discrimination exists if S_j is positive: members of NW receive less from the local government in services than they pay in taxes.

The model is closed with the addition of three equations:

$$(2) \quad w_j = F_L(L_j, K_j)$$

$$(3) \quad \Sigma L_j = \underline{L}$$

$$(4) \quad V(w_j - t_j, g_j) = V^*$$

Equation (2) states that the labor market in each community is competitive while equation (3) says that aggregate demand for NW labor must equal aggregate supply. Equation (4) states that the equilibrium level of utility V^* of NW households must be the same in all communities, because tastes are identical and households are freely mobile.

The objective of each local government is to select a g and t that maximizes aggregate W income in its community, subject to equations (2)-(4). Consider first $J = 1$, or no mobility. If $J = 1$ NW households cannot escape to a rival community, and the local government should obviously set $g = 0$ and $t = w$. In the case of imperfect mobility (J greater than one but finite) I imagine that each local government plays a one-shot, non-cooperative Cournot-Nash strategy. The first order conditions in this case are (see the appendix):

$$(5) \quad V_g/V_w = p$$

$$(6) \quad S/w = 1/(J - 1)e$$

where $e = -(w/LF_{LL})$, the (absolute) value of the elasticity of demand for NW labor. When exit is possible, some amount of g will generally be produced; further, the production of g will be "efficient" in the usual sense. But equation (6) shows that government discrimination will exist as long as S/w is positive, that is, unless NW mobility were perfect (J infinite).

The special case of Cobb-Douglas utility [$V = (w-t)^b g^{1-b}$] and production [$Q = L^a K^{1-a}$] provides additional intuition into the extent of government discrimination and its implications for NW utility when J is finite. As a benchmark, I use the values of optimal values of g and t in the absence of discrimination; call these g^* and t^* . It can be shown that:

$$(7) \quad (g^* - g)/w = (1 - b)(1 - a)/(p(J - 1))$$

$$(8) \quad (t - t^*)/w = (1 - a)b/(J - 1)$$

$$(9) \quad S/w = (1 - a)/(J - 1)$$

Table 1 presents calculations of $(g^* - g)/w$, $(t - t^*)/w$, and S/w for $p = 1$ and various values of a , b , and J . The values chosen for the parameter a (labor's share in the Cobb-Douglas case) reflect the actual variation that existed in the early twentieth century South [DeCanio, 1974, p. 207]. When J is small -- exit is costly -- the degree of discrimination, as indicated by S/w , is quite large, on the order of 30 to 40 percent of the NW wage. If b is also small -- NW households place a high value on g -- the degree to which g is under-provided, relative to the no-discrimination level, is also large. When $J = 75$, however-- the same order of magnitude as the number of counties in many Southern states -- the extent of discrimination is negligible.

III. THE MOBILITY MODEL AND SEGREGATED SCHOOLS: EMPIRICAL EVIDENCE

The first implication of the mobility model is that, by the threat or actuality of voting with their feet, blacks limited the extent of local government discrimination against them. Literary evidence indicates that, in the case of segregated schools, local officials were aware of this constraint on their behavior. "Already there has been a considerable emigration of the Negroes," wrote J.W. Joyner [1910, p. 54], state superintendent

of public instruction of North Carolina, less than a decade after blacks were disenfranchised in his state:

There is no surer way to drive ... them from the state by keeping up this continual agitation about withdrawing from them the meager educational opportunities they now have. Their emigration in large numbers would result in a complication of the labor problem. Some of our Southern farms would be compelled to lie untenanted and untilled. The experience of one district in Wilson county illustrates this. The county board of education found it, for various reasons impossible to purchase a site for a Negro school house. Before the year was out the board received several offers from farmers in the district to donate a site. Upon inquiry by the chairman of the [school] board as to the reasons for these generous offers, he was told that when it was learned that no site for the school house could be secured and the Negroes were to have no school in that district, at least one-third of the ... Negro tenants and laborers there moved into other districts where they could have the advantages of a school. This is a practical side of this question that our people would do well to consider. What happened in this district will happen in the entire state if we give the best Negroes reason to believe that their public school priveleges are to be decreased or withdrawn.

Starting around World War One a "considerable emigration of Negroes" did begin throughout the South. Joyner's fears were well-founded. The existence of heavy black out-migration seems to have prompted the following discussion at a school board meeting in East Feliciana Parish, Louisiana [Foote and Robertson, 1926, pp. 20-21]:

That the Negroes are an economic asset would not be challenged. That they have been leaving the parish ... has clearly been shown by the data from the census reports ... [T]he consensus of opinion among both white and Negro leaders ... is that one of the most potent influences in retaining them is the provision of reasonably satisfactory school facilities.

A similar consensus seems to have been reached in Lowndes County, Alabama ca. 1920 where "[a]bout the Calhoun Colored School ... there [were] perhaps a hundred Negro farmers ... Not one of these men has been attracted away ... they remain on account of the good schools for their children" [Foner and Lewis, 1980, p. 241].

Some econometric evidence on the mobility model is provided by a regression analysis of pooled time-series, cross-section parish data from Louisiana for 1920, 1930, and 1940.⁴ The dependent variable is the change in the length of the school year in the parish's black schools between successive decades (for example, 1920 to 1930). I use the length of the school year to

measure the parish's educational commitment rather than, for example, per pupil expenditures, because previous research has shown that the length of the school year was a critical determinant of the educational achievement of black children [Welch, 1973; Margo, 1986, 1987; Orazem, 1987].

The independent variables are a constant, a dummy for the 1930s, and $PB_{t-10} - PB_{t-20}$, the lagged change in the proportion of blacks in the parish.⁵ The idea is to see if the coefficient of this variable was negative: parishes that experienced a decrease in the black population share (such as East Louisiana parish) responded by improving the black public schools, that is, by increasing the length of the black school year.⁶ Because the general "tightness" of Southern labor markets was greater in the 1920s than in the Great Depression decade of the 1930s (Wright, 1986), I allow the coefficient to vary across decades.

The results, displayed in Table 2, are broadly consistent with the model. The coefficient of the lagged change in the black population share was negative and statistically significant in the 1920s, but was insignificantly different from zero in the 1930s.⁷ Evidently Louisiana school officials felt compelled to respond in the labor scarce 1920s to black out-migration between 1910 and 1920, but not during the labor surplus 1930s. However the coefficient of the 1930s dummy is positive and also significant, indicating that the length of the black school year increased during the 1930s, independent of black out-migration during the 1920s. This suggests that the mobility model cannot

fully resolve Myrdal's paradox, a point I return to in the concluding section.

The second implication of the mobility model concerns the tax burden of segregated schools: blacks should have received less in school expenditures than they paid in taxes. Although the issue is by no means settled, recent studies generally confirm this prediction for the early twentieth century [Smith, 1974; Pritchett, 1989, p. 973]. Smith's [1974] estimates, expressed per adult black male, are reproduced in Table 3.⁸ In four "border" states with small black populations -- Kentucky, Missouri, Tennessee, and West Virginia -- the subsidy went from whites to blacks. In the more heavily black West South Central and Deep South states the blacks were subsidizing white schools.

The average subsidy from blacks to whites was \$3.09 per adult male, or 73 cents per black person. Recent estimates of Southern blacks' per capita income at the turn of the century suggest a range between \$55.00 and \$91.00 [Higgs, 1977, p. 100]. As a fraction of black income (s/w in the mobility model) the subsidy to whites was evidently small, 0.8 to 1.3 percent.

The simulation results in Table 1 imply that a small subsidy requires a high degree of black geographic mobility. Recent studies reveal that Southern blacks were, in fact, highly mobile across county (and state) boundaries [Higgs, 1977; Wright, 1986]. Thus the evidence on the tax burden of segregated schools is consistent with the mobility model.

IV. CONCLUSION: THE LIMITATIONS OF EXIT

In modern times, the moral indictment of slavery rests, in part, on the slave's inability to legally escape exploitation by exercising an option open to free labor -- mobility (Fogel, 1989). The Emancipation Proclamation and the Northern victory in the Civil War ended slavery, and with it came the right of exit. The evidence is compelling that geographic mobility hindered the ability of southern whites to discriminate against their former chattel in private employment contracts (Higgs, 1977; Wright, 1986). This paper argues that an analogous constraint operated in the public sphere, in the case of de jure segregated public schools.

The limitations of the mobility model should be kept in mind for two reasons. First, the threat of mobility worked best at the elementary school level, because the school districts numbered in the thousands and were spread over a large area. "Collusion" by local school boards (to keep expenditures on black schools even lower than they were) was impractical within states, improbable across state boundaries, and impossible across the Mason-Dixon line. When the efficient scale of public schools was large relative to the geographic dispersion of the black population and its per capita demand for education -- as was the case with higher education early in the century -- mobility was an ineffective weapon. The loss of the tiny fraction of black families ca. 1910 who could afford to send a child to high school

or even college would have made no dent in the Southern economy. Black children who wished to go to such schools attended private institutions, for public versions open to them were extremely few and far between.⁹ Well into the century it was far cheaper for Southern state governments to offer scholarships to black students to attend public universities in the North rather than open a separate-but-equal facility or to desegregate, until the practice was outlawed by the Supreme Court in its 1938 decision, Gaines vs. Missouri (Tushnet, 1987, p. 72).

Second, even if Southern blacks had been frozen in space, there were other incentives prodding school officials in the same direction. Although the separate-but-equal doctrine was not enforced, it still was the law, and it is highly doubtful that Southern state courts (who were hardly partial to black causes) would have stood for a complete dismantling of the black public schools at the elementary level.¹⁰ Some whites supported increased spending in the black schools on the grounds that the South would benefit from a better-educated black labor force, provided the schools did not threaten the existing social order [Bond, 1939; Freeman, 1973; Harris, 1985].¹¹ "We want [Negroes] to become better cooks, better servants, better washwomen, better workmen in field and shop. We will cheerfully pay ... to give him that kind of schooling."¹² Philanthropic organizations, such as the Julius Rosenwald and Anna Jeanes Foundations, provided matching grants to build new schools and train black teachers which, at the margin, created an incentive for local school

officials to maintain (and improve) the black schools. The mobility model complements, rather than precludes, these other solutions to Myrdal's paradox.

In the final analysis, neither the threat of exit nor the other incentives were sufficient to compel Southern whites to voluntarily abide by the equal part of the separate-but-equal doctrine.¹³ Beginning in the 1920s the NACCP began a concerted legal effort to end de jure segregation in Southern public schools [Kluger, 1977; Tushnet, 1987]. Their initial strategy was to convince the South that segregation would be too expensive to maintain under a strict interpretation of separate-but-equal. They were aided in the battle by a series of studies, beginning with Jones [1917] and ending with Myrdal [1944], which informed national opinion and brought adverse publicity down on the South. The legal tide turned in favor of the NACCP by the early 1940s with the successful outlawing by the Supreme Court of racially-based teacher salary schedules. Concerned that it might lose the separate part of separate-but-equal, the South began to pay closer heed to the equal part; between 1940 and 1950 the black-to-white ratio of per pupil expenditures rose from 0.45 to 0.70 [Margo, 1990, ch. 2]. By then it was too late; the NACCP had shifted gears to its "separate-but-equal is inherently unequal" strategy, which culminated successfully in the Supreme Court's 1954 decision, Brown vs. Board of Education of Topeka, Kansas. Ultimately it took a political weapon -- the courts and protest activity -- to end an injustice that political upheaval--

disenfranchisement -- had caused in the first place.

APPENDIX

To derive equations (5) and (6) in the text, it is necessary to specify each local government's beliefs about dv^*/dg_j , dw_j/dg_j , dv^*/dt_j , and dw_j/dt_j . I assume that, when varying its g and t , local government j imagines that other local governments will keep their g 's and t 's fixed. To derive dv^*/dg_j and dw_j/dg_j , I totally differentiate equations (2)-(4) for all j in C_j , keeping in mind that $dt_j=0$ and $dg_i=dt_i=0$ for all $i \neq j$:

$$(10) \quad F_L L dL_i = dw_i$$

$$(11) \quad \Sigma dL_i = 0$$

$$(12) \quad V_w dw_i + V_g dg_i = dv^*$$

After some algebra one can show:

$$(13) \quad dv^*/dg_j = V_g s_j$$

where $s_j = (V_w F_{LL})^{-1} / \Sigma (V_w F_{LL})^{-1}$. Under the assumptions made the Nash equilibrium, if one exists, will be symmetric, so $s_j = 1/J$.

Hence:

$$(14) \quad dv^*/dg_j = V_g/J$$

Substituting (14) into (12) gives:

$$(15) \quad dw_j/dg_j = - (V_w/V_g)(J-1/J)$$

By a similar calculation one can show:

$$(16) \quad dv^*/dt_j = -V_w/J$$

$$(17) \quad dw_j/dt_j = (J-1)/J$$

The Lagrangian, L , for the local government's optimization problem is:

$$(18) \quad L = F(L_j, K) - w_j L_j + S + \beta_1(F_L - w_j) + \beta_2(L - \Sigma L) + \beta_3(V^* - V(w_j - t_j, g_j))$$

Differentiating (18) with respect to g_j and t_j , substituting in (14)-(17), and simplifying gives equations (5) and (6).

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FOOTNOTES

1. See, for example, Bond [1939], Harlan [1958], Freeman [1973], Welch [1973], Kousser [1974, 1980], Margo [1990], and Pritchett [1986].

2. Calculated from data in Margo [1990, ch.2]. The evidence is strong that the violations of separate-but-equal hindered black economic progress in the twentieth century; see Margo [1986, 1987] and Orazem [1987].

3. The assumptions of a lump sum tax and fixed capital serve to focus attention on the total incidence of taxes on NW (compared with expenditures on local public goods). When applied to segregated schools, the assumptions do historical violence in two ways: taxes on white-owned property were an important share of school revenues, and the Southern capital stock (specifically improvements to land, and structures) was not fixed in the aggregate. It is easy to see, however, that in a model with taxes on W-owned property, that the model's basic point -- some amount of the public good will be supplied to the disenfranchised group, as long as NW labor is mobile across jurisdictional boundaries -- still holds. (If a jurisdiction supplied no local public goods to NW households, while others did, it would lose all of its NW residents, and the value of W-owned capital would fall to zero). If the capital stock is not fixed in supply in the aggregate, some of the tax will be shifted back onto NW

households. Such tax shifting, in fact, was a key historical reason why black households were subsidizing white schools; see Pritchett (1989) and Section III.

4. The Louisiana "parish" is administratively equivalent to a county in other states.

5. That is, if the dependent variable refers to the 1930s the change in the black population is that which occurred in the 1920s.

6. Alternatively, one might test if the black population share increased, say between 1910 and 1920, in parishes whose black schools were "better" in 1910 (as indicated by a longer school year). Such a regression produced a positive coefficient on the length of the school year, as predicted, although the coefficient was insignificantly different than zero.

7. Similar results obtain if parish "fixed effects" (dummy variables for parishes) are added to the regression.

8. While critical [Pritchett, 1986] of Smith's estimates, Pritchett [1989] also concludes that blacks were probably subsidizing white schools ca. 1910, that is, after disenfranchisement.

9. According to Jones (1917), there were only 53 public high schools for blacks in the entire South on the eve of World War One. Virtually all of these were in cities and towns, while

the majority of the Southern black population lived in rural areas.

10. Risen [1935] cites early twentieth century cases in which Southern state courts which prohibited a racial division of school expenditures on the basis of taxes paid, that is, blacks were entitled to public schools whether or not they paid taxes.

11. The difficulty with this argument is that better-educated blacks were more likely to leave the South; thus white employers would have difficulties capturing the return on their investment in better-educated black labor; see Wright [1986], and Margo [1990, ch. 7].

12. Quoted in Freeman [1973, p. 35].

13. West Virginia may be an exception; see Fishback [1989].

TABLE 1

Local Government Discrimination: Cobb-Douglas Case

		b = 0.05		
		J = 3	J = 10	J = 75
$(g^* - g)/w$	a = 0.15	0.404	0.090	0.011
	a = 0.45	0.260	0.058	0.007
$(t - t^*)/w$	a = 0.15	0.021	0.005	0.0006
	a = 0.45	0.014	0.003	0.0004
S/w	a = 0.15	0.430	0.090	0.001
	a = 0.45	0.280	0.060	0.007
		b = 0.10		
$(g^* - g)/w$	a = 0.15	0.383	0.085	0.010
	a = 0.45	0.248	0.055	0.007
$(t - t^*)/w$	a = 0.15	0.028	0.009	0.001
	a = 0.45	0.027	0.006	0.0007

NOTE: only one set of calculations of S/w is presented because S/w is independent of the value of b in the Cobb-Douglas case.

TABLE 2

Regression of Change in Length of Black School Year:

Louisiana, 1920-1940

Variable	Mean	Coefficient	T-statistic
Constant		0.016	0.480
Lagged Change in Black Population Share	-0.035	-1.530	-2.647
Decade=1930s	0.516	0.251	4.760
Lagged Change in Black Population x Decade=1930s	-0.017	1.697	2.325
N	124		
R ²		0.220	

Source: Dependent Variable, State of Louisiana, State Superintendent of Public Instruction [1920, 1930, 1940]; Lagged Change in Black Population Share, U.S. Bureau of Census [1918, 1935]

TABLE 3

The Racial Burden of School Taxes: The
Subsidy from Blacks to Whites, 1910

State	Total	Per Adult Male
Alabama	\$642,825	\$3.00
Arkansas	357,818	3.21
Florida	155,093	1.73
Georgia	1,021,804	3.83
Kentucky	-377,470	-4.99
Louisiana	1,479,015	8.49
Maryland	157,418	2.46
Mississippi	708,323	3.03
North Carolina	336,841	2.30
South Carolina	728,095	4.30
Tennessee	-77,896	-0.65
Texas	1,190,955	7.15
Virginia	497,749	3.12
West Virginia	-137,198	-6.02
South, total	6,385,547	3.09

Source: Smith [1974].