Involuntary Integration in Public Education, Fertility and Human Capital

Leonid V. Azarnert*

Department of Economics, Bar Ilan University, Ramat Gan, 52900, Israel

Abstract

This article analyzes the negative side of involuntary integration in public education – its effect on whites. The model shows that the flight from the integrated multicultural public schools to private education increases private educational expenditures and decreases fertility among more affluent whites whose children flee. In contrast, among less prosperous parents multicultural integration in public education decreases their children's human capital levels. The analysis also demonstrates that among whites the poor, who can not afford to avoid the forcible integration, suffer from a higher negative effect than the rich, who can resort to the White Flight.

Keywords: Education, Integration policy, White Flight, Fertility, Human capital

JEL classification: I2, J1

* Tel.: +972-3-5317534; Fax: +972-3-7384034
E-mail address: azarnel@mail.biu.ac.il

1. Introduction

After *Brown v. Board of Education* decision of the US Supreme Court in favor of blacks in 1954, racial integration in public schools became one of the principle goals of public education policy.[1] Benefits of racial integration in public education for blacks and other disadvantaged minorities have long been well established in both academic literature and public discussion. The present paper abstracts from these undisputable benefits and concentrates on the effect of integration on whites that, in contrast, has been largely ignored in the discussion over the costs and benefits of the socially desirable public education policy.

A long line of the research has overwhelmingly shown that white students' choice between public and private schools is influenced by the racial composition of the local student population. Starting from the 1970s, numerous studies, such as, for example, Clotfelter (1976; 2001), Coleman, Hoffer and Kilgore (1982), Conlon and Kimenyi (1991), Andrews (2002), Fairlie and Resch (2002), Reber (2005), Lankford and Wyckoff (2006), among others, presented evidence of White Flight from the integrated multicultural public schools with large concentrations of black or minority children into private education.[2] Predictably, the clearest flight has been observed from the poor black schoolchildren. Betts and Fairlie (2003) found evidence of the "Native Flight" from minority immigrants. They also found that white students account for almost all the observed flight. Fairlie (2002) has also provided evidence of the "Latino Flight" from the blacks that is not significantly different from the flight of whites. Although the term "Asian Flight" has not yet been coined, very high rates of private school attendance among the US-Born Asians, which are even higher than the private school attendance among white Americans (e.g., Betts and Fairlie 2001; Fairlie and Resch 2002), may also point to the unwillingness of Asians to sand their children to the same schools as blacks. In addition, outside the United States, the desire of white parents to have their children

[1] After *Brown v. Board of Education* was decided, Prof. Herbert Wechler questioned whether the Supreme Court's decision could be justified on the basis of "neutral" principles. To him Brown arbitrary traded the rights of whites not to associate with blacks in favor of the rights of blacks to associate with whites.

[2] Although flight to another, less desegregated, public school may also be an option (e.g., Reber 2005), as Lankford and Wyckoff (2006) note, in the areas where the open enrollment plans have been established to achieve desegregation, the public school choice available to parents is quite limited. As they note, whites

educated in predominantly white schools has been well documented, for example, in the United Kingdom (Bagley, 1996). Within this context, it has been also argued that higher levels of family income and parental education have a strong positive effect on the probability that children will attend private schools (e.g., Lankford and Wyckoff, 2001; Betts and Fairlie 2001; 2003; Fairlie 2002; Fairlie and Resch 2002; Epple et al 2004).

Although no consensus has been reached in the literature on the causes of the flight, the authors of these studies speculate that White Flight is due to the use of the racial composition of the school as a signal of academic quality in response to a lack of other measures of quality along with a distaste of white families for their children being in the same schools as black or minorities. A more extensive list of the reasons include, for instance, expectations about poor management of schools where large groups of minority children are enrolled, lower level of discipline in multiethnic classes, peer group effect of a less advantaged school-student population, the desire to avoid contacts with black hooligans, some other characteristics of black youth that white parents fear or dislike,[3] parental fear that teachers may decide to spend additional time helping minority students with limited proficiency in the mainstream language at the expense of other students in the classroom or that the presence of the students with limited language proficiency in public school may lead to wholesale changes in teaching methods used for all students.[4] For any reason that causes parents to expect that multicultural integration in public school is likely to reduce their children's acquisition of human capital, the effect of integration on whites is the same, and this paper is about the effect, not about the reasons.

This article provides a theoretical framework to analyze the effect of involuntary multicultural integration in public education and the resulting educational White Flight, meaning exit from or avoidance of racially mixed public schools in favor of private education, on the fleeing population. It discusses the issue in the context of a model with

---

living in school attendance areas having relatively "too few" whites in the local public school have no public school choice at all.

[3] For example, Freeman (1994) reports that among African-American males aged 18 – 34 in 1993, 12.7% of the work force were incarcerated and 36.7% of the work force were under the supervision of criminal justice system.

[4] To provide an illustrative example, Betts and Fairlie (2003, p. 989, note 4) refer to an observation that, for instance, in a "methods" class at Cal State Long Beach would-be teachers, who will probably wind up in classrooms with a large number of students not fluent in English, were encouraged to find ways to avoid writing, instead of emphasizing it.

endogenous fertility building on Azarnert (2006; 2008b) that is related to the literature on endogenous fertility and growth.[5]

The prediction of the present model that opting out of public education to the expensive private education, which increases the cost of having children, is associated with a reduction in fertility, is consistent with the traditional theory of endogenous fertility, which implies that any increase in the cost of rearing children leads to a lower fertility choice. Among empirical studies, Lankford and Wyckoff (2001) demonstrated that the choice of private education for children is associated with lower number of children within the family. De la Croix and Doepke (2007) also found an empirical support for their hypothesis that parents who choose public schools for their offspring have more children than parents who choose costly private schools. Equipped with these findings of the previous theoretical and empirical literature, the present work enriches the analysis with a novel channel, through which public education policy can generate a different effect on the level of fertility among ethnic groups that differ from each other with respect to their average rates of participation in public education.

The present paper is also close in spirit to the literature on segregation between the rich and the poor that has been recently advanced, for instance, in a serious of publications by Benabou (e.g., Benabou 1996), among others. De la Croix and Doepke (2007), whose work is closest to the subject-matter of the present paper, provided a theory, which integrates private education and fertility decisions with voting on public schooling expenditures. In contrast to this traditional literature on segregation, the present paper is more in line with the huge recent literature that suggests that in a modern multiethnic society racial cleavages have become more important than class cleavages.[6] Within the particular context of the theme of the present work, it has been decisively demonstrated that the racial composition of suburban public schools appears to be the key in explaining why, as compared to white urban families, relatively few suburban families send their children to private schools (e.g., Lankford and Wyckoff 2006).

[5] For a survey of a recent literature on endogenous fertility and growth see Galor (2005); cf. also Azarnert (2008a).
[6] A long line of references can be found, for instance, in the classical study by Alesina et al (1999).

In this paper, I assume that the basic education provided in public school is financed by taxes levied outside the economic environment that is being examined[7] and thereby is free for families. This allows us to abstract from the negative effect of taxation on individuals' decisions with respect to the optimal investments in the quantity and quality of their offspring[8] and concentrate on the pure effect of the multicultural integration in public education. This is a simplification assumption only. Assuming that public schools are financed by an endogenously determined tax,[9] which implies a reallocation of resources from the rich, who can resort to the White Flight strategy, will increase the threshold level of income (human capital), above which parents decide in favor of opting out of public education, without altering the qualitative nature of this paper's results.

The basic idea of this paper may be stated as follows. Assume an economy populated with two different groups: the Whites and the Blacks.[10] Human capital in this economy can be acquired either in integrated multicultural school, or in exclusive private school. Suppose that public and private schools have access to the same technology of human capital production. Suppose also that in the public school some basic education is provided at zero cost. In contrast, all of the costs of the acquisition of human capital in the exclusive private school should be financed by parents themselves.

Assume that for some reason, for instance, expectations about poor management of schools where large groups of minority children are enrolled, low level of discipline in multiethnic classes, peer group effect of a less advantaged student population, general difficulties for teaching in more heterogeneous classes, or simply a threat from black hooligans, white parents expect that in the integrated school their children will not devote their entire time to the acquisition of human capital. If parents expect that in the integrated

---

[7] In this case the particular tax levied in order to finance public education is irrelevant for the analysis. For example, it could be a lump sum tax or a local property tax along with direct aid received exogenously from the government (as e.g. in Nechyba 2003); cf. also Azarnert (2008b; 2009).

[8] The disincentive effect of taxation has been well recognized in the literature (see, e.g. Azarnert (2004) and references therein).

[9] Some references to the large literature on this subject can be found in Epple et al. (2004), de la Croix and Doepke (2007), Azarnert (2008b); cf. also Benabou (2002).

[10] This is an approximation to the situation in the integrated urban areas where the exit of whites has not been complete. In contrast, in the segregated suburban areas, where students' population in public schools is almost entirely white, whites show much lower interest in private education (e.g., Lankford and Wyckoff 2006, among others), which is consistent with the prediction of the present model.

school their children are likely to spend a fraction of their time unproductively, this generates an incentive to opt out and flee to the exclusive private school. Provided that the exclusive private education is more expensive, only more affluent parents can afford opting out of the public school.

The flight to more expensive private education increases parental private expenditures on the education of their offspring and, as a result, increases the total cost of having children. Provided that children are viewed as a normal good, this increase in the cost of children decreases fertility among more affluent whites whose children flee integrated public schools. In contrast, among relatively less skilled (poor) parents, who can not afford private education for their offspring, multicultural integration in public education decreases their children's human capital levels.

In this work, I derive the threshold level of human capital (income) that divides the white population into two groups: the more educated (wealthy), for whom opting out is optimal, and the less educated (poor), who can not afford to resort to the White Flight. Then I demonstrate that among whites the poor, who can not afford to avoid the forcible integration, suffer from a higher negative effect than the rich, who can resort to the White Flight and lower their losses, though at the expense of the reduction in the number of their children.

The results of the present analysis suggest that for a true evaluation of the society-wide effect of the integration policy it is not only necessary that the benefits of integration for the disadvantaged minorities should be appreciated, but also that the costs of involuntary integration for whites (and especially for the less prosperous among them) should equally not be ignored. These results appeal for a reassessment of the costs and benefits of the aggressive integration policy and may thus have strong policy implications.

In addition, thought the population that suffers from integration is referred to in this paper as whites, the present analysis is not specific to one ethnic group only and can be also applicable to Latinos, whose flight from blacks that has been recently observed (Fairlie 2002), as well as to the other ethnic groups (for example, the US-born Asians, whose flight from integration is suggested by very high rates of their private school attendance (Betts and Fairlie 2001; Fairlie and Resch 2002)), whose flight from blacks had not yet attracted attention of researchers.

2. The Basic Structure of the Model

Consider an overlapping-generations economy, in which activity extends over an infinite discrete time. In every period the economy produces a single homogenous good using a constant-returns-to-scale technology with human capital as the only input. In each generation, agents live for two periods: childhood and adulthood. During childhood, individuals acquire human capital. During adulthood, they work, become parents and bring up their offspring. As parents, adult individuals allocate a positive fraction of their time to feeding and raising their children and invest in the education of their children.

The economy is populated with two different groups: the Whites and the Blacks. Children of both groups can acquire human capital in public school. If white children flee the integrated public school, they acquire education in a more expensive private school. The analysis abstracts from the Blacks who are outside the model and concentrates on the results of the integration policy in public education for the Whites only.

2.1. Human Capital Production

In the first period of life children are endowed with one unit of time. In the exclusive private school children devote their entire time to the acquisition of human capital. In the integrated multicultural public school children spend a fraction $1-\theta$ of their time unproductively, as follows from, for example, poor management of schools where large groups of minority children are enrolled, lower level of discipline in integrated classes, peer group effect of a less advanced student population, general difficulties for teaching in more heterogeneous classes, or simply a threat from black hooligans. As a result, they devote to the acquisition of human capital a fraction θ of their time only $(0<\theta<1)$.

In the public school a certain amount of human capital – equal for all children – is provided at zero cost for their parents. This basic public education is assumed to be financed by taxes levied outside the economic environment that is being examined. In addition, to increase their children's human capital levels, parents supplement this basic public educational expenditure with their own private investments in their children’s

human capital. In the exclusive private school all the costs of the acquisition of human capital are assumed to be financed by parents themselves.

The human capital level of a child, who becomes an adult at period $t+1$ (h_{t+1}) is therefore an increasing function of the public per-child expenditure (α) if a child acquires education in the public school, the parental real expenditure on the child's education in private or public school in period t (e_t), as well as the child's time investment (θ):

$$h_{t+1} = h(\alpha, \theta, e_t). \quad (1)$$

A particular form of human capital production function is specified below in Eq. 8.

2.2. The Optimization of Parents

Under both scenarios (in the case of White Flight and in the case on No Flight), agents derive utility from their own consumption in adulthood and from the total future income of their children. The utility function of an individual born at time $t-1$ is therefore

$$U_t = (1-\beta)\log C_t + \beta \log(I_{t+1}^{N,j}), \quad (2)$$

where C_t is an individual's own consumption, $I_{t+1}^{N,j}$ is the future income of the one's offspring and $\beta \in (0,1)$ captures the relative weight given to children. In the case of White Flight $j = F$ and in the case of No Flight $j = NF$. The conditions that lead to the decision to resort to flight are analyzed below in Section 2.5.

In every period *t*, adults are characterized by a skill level h_t that is distributed over $[h_t^{\min}, h_t^{\max}]$ and are endowed with one unit of time, which they allocate between childbearing and labor force participation. The cost of feeding and raising children is measured in terms of work time foregone at δ per child. The cost of acquiring human capital is measured in units of the wage per efficiency unit of labor (*w*).

Under each scenario ($j = F$ or $j = NF$), in order to maximize utility, an adult simultaneously chooses a current consumption, C_t, the number of children, N_t^j, and

invests e_t^j units of w in each child's education subject to the following budget constraint:[11]

$$C_t + w(\delta h_t + e_t^j)N_t^j \leq wh_t, \tag{3}$$

while the total future income of the one's offspring is:

$$I_{t+1}^{N,j} = N_t h_{t+1}^j w. \tag{4}$$

The right-hand side of Eq. (3) represents an adult's income, which is allocated between consumption and the total cost of rearing children. Under each scenario ($j = F$ or $j = NF$), the amount of resources invested in the education of each child (e_t^F or e_t^{NF}) and hence the children's levels of human capital (h_{t+1}^F or h_{t+1}^{NF}), as well as the total number of children (N_t^F or N_t^{NF}), may be different. The wage per efficiency unit of labor, *w*, is fixed over time, as follows from, for instance, the assumption of a CRS technology with a single factor of production.

2.3. Quantity - Quality Tradeoff

From optimization, regardless of the choice of public or private education for his children, an adult's consumption is

$$C_t = (1-\beta)wh_t. \tag{5}$$

That is, a fraction $1-\beta$ of an adult's full income is devoted to consumption and hence a fraction β is devoted to childrearing.

In order to allocate resources between children's quantity and quality, an adult makes two simultaneous decisions. First, he decides how much consumption to forego during his adulthood to rear a family. Second, he decides what amount of resources to invest privately in the education of his children to increase their skill level.

Under each scenario, in the case of a non-corner solution, the standard condition of setting the marginal rate of substitution between quality and quantity equal to the price implies that

---

[11] The time constraint requires that $0 \leq 1-(\delta + e_t^j / h_t)N_t^j \leq 1$.

$$\frac{h_{t+1}^j}{N_t^j} - \frac{\delta h_t^j + e_t^j}{N_t^j / \left(dh_{t+1}^j / de_t^j\right)} = 0 \quad \text{if} \quad e_t^j > 0, \tag{6}$$

where h_{t+1}^j / N_t^j is the marginal rate of substitution between quality and quantity, $w(\delta h_t^j + e_t^j)$ is the cost of an additional child for a given level of parental private investment in the child's education and $wh_t^j N_t^j / [dh_{t+1}^j / de_t^j]$ is the marginal cost of children's quality (human capital) for a given number of children.

From Eq. (6), optimization with respect to child's quality thus implies that

$$h_{t+1}^j = \left(\delta h_t^j + e_t^j\right) \frac{dh_{t+1}^j}{de_t^j}. \tag{7}$$

The next subsection discusses the solution for the parents' optimization problem for a particular form of the human capital production function and analyzes the effect of integration in public education on parental educational expenditures, children's human capital levels and fertility.

2.4. Choice of Fertility and Investment in Education

In order to characterize optimal choices of fertility and investment in schooling, suppose that public and private schools have access to the same technology of human capital production:

$$h_{t+1} = (\theta(\alpha + e_t^j))^\gamma, \quad 0 \le \theta \le 1, \quad \alpha \ge 0, \quad 0 < \gamma < 1. \tag{8}$$

In this particular learning technology the parameter θ captures the major difference between the integrated and exclusive education. As has been assumed in Section 2.1, in the exclusive school, children devote their entire unit of time to the acquisition of human capital ($\theta = 1$), whereas in the integrated multicultural school they devote a fraction θ of their unit of time only ($0 < \theta < 1$). The parameter θ is exogenously given here, but in a more general setting it can be inversely related to the fraction of black, or, more generally, minority children in the integrated school.

The difference between public and private education is captured here by the parameter α that measures the level of public educational expenditures per child in the public school ($\alpha > 0$), which in this work are assumed to be financed by taxes levied

outside the model. In contrast, all of the expenditures in the private school are financed by parents themselves, so that in the case of the private school $\alpha = 0$.

Given the differences between public and private education, as captured by θ and α, this human capital production technology can be re-formulated as:

$$h_{t+1}^{j} = \begin{cases} (\theta(\alpha + e_t^j))^{\gamma}, & \text{if } j = NF \\ (e_t^j)^{\gamma}, & \text{if } j = F \end{cases} \qquad 0 < \theta < 1, \quad \alpha > 0, \quad 0 < \gamma < 1. \qquad (8')$$

Given $(8')$, the optimal choice of an individual's private investment in the children's education in the integrated and private schools is[12]

$$e_t^j = \begin{cases} \dfrac{\gamma\delta h_t - \alpha}{1-\gamma}, & \text{if } j = NF \\ \dfrac{\gamma\delta h_t}{1-\gamma}, & \text{if } j = F, \end{cases} \qquad (9)$$

so that, according to (7),

$$h_{t+1}^{j} = \begin{cases} \left(\dfrac{\theta\gamma(\delta h_t - \alpha)}{1-\gamma}\right)^{\gamma}, & \text{if } j = NF \\ \left(\dfrac{\gamma\delta h_t}{1-\gamma}\right)^{\gamma}, & \text{if } j = F. \end{cases} \qquad (10)$$

Given the amount of resources allocated to children's education in each of the cases, the desired fertility is

$$N_t^j = \begin{cases} \dfrac{\beta(1-\gamma)}{\delta - \alpha/h_t}, & \text{if } j = NF \\ \dfrac{\beta(1-\gamma)}{\delta}, & \text{if } j = F. \end{cases} \qquad (11)$$

The following proposition summarizes the main result concerning the effect of White Flight on individuals' expenditures on the education of their children, the children's human capital levels and fertility.

Proposition 1: *The flight of children from the integrated multicultural public school*

(1) Increases their parents' private expenditures on the children's education.

Proof. Eq. 9.

(2) Increases the children's human capital levels.

Proof. Eq. 10.

(3) Decreases fertility among the parents whose children flee.

Proof. Eq. 11.

In the next section, I derive conditions that lead to the choice of flight in preference to no flight and analyze the losses of whites from integration.

2.5. To Flee Or Not To Flee? The Losses of Whites from Integration

In this section, I first analyze the tradeoff between the multicultural public school and the exclusive private school. Next, I analyze the losses of whites from integration.

Recall that, on the one hand, a significant fraction of the expenditures in the integrated public school is financed by the government, whereas all the expenditures in the exclusive private school are financed by parents themselves. As a result, a certain amount of children's education in the integrated public school is provided for free for parents. On the other hand, in the integrated public school, children devote less time to the acquisition of skills.

In order to establish conditions that lead to the choice of flight over no flight, compare the levels of parental utility derived under both scenarios. As long as $U_t^{NF} \geq U_t^F$, it is optimal to stay in the integrated public school. Once this inequality is reversed, it is optimal to leave public school in favor of the exclusive private education. From optimization, as determined in Eq. (5), adults' consumption remains unaffected whether their children attend public school, or opt out to private education. Therefore, the level of parental utility in the case of flight (U_t^F) is higher than the level of parental utility in the case of no flight (U_t^{NF}) if the total future income of the one's children in the case of flight ($I_{t+1}^{N,F}$) is higher than the corresponding total children's income in the case of no flight

---

[12] An assumption that $h_t^{\min} > \alpha/\gamma\delta$ assures that all parents invest in the education of their children if $j = NF$.

($I_{t+1}^{N,NF}$). From Eq. (4), given the optimal levels of fertility and the children's human capital, as shown in Eqs. (10) and (11), $I_{t+1}^{N,F} = N_t^{N,F} h_{t+1}^{F} w \geq I_{t+1}^{N,NF} = N_t^{N,NF} h_{t+1}^{NF} w$, if

$$h_t \geq \hat{h} = \frac{\alpha}{\delta(1-\theta^{\gamma/1-\gamma})}. \tag{12}$$

Given Eq. (12), Proposition 2 determines precisely when it is optimal to send children to the multicultural public school and when it is optimal to opt out and educate children in the exclusive private school.

Proposition 2: *For parents with human capital levels below the threshold* $\hat{h} = \alpha/\delta(1-\theta^{\gamma/1-\gamma})$, *the no-flight strategy is optimal, whereas for parents with human capital levels above that threshold, the flight strategy is optimal.*

Proof. Substituting the optimal levels of C, h_{t+1}^{j} and N_{t+1}^{j} into (2) yields that $U_t^{NF} \geq U_t^{F}$, if $h_t \leq \alpha/\delta(1-\theta^{\gamma/1-\gamma})$ and $U_t^{NF} \leq U_t^{F}$, if $h_t \geq \alpha/\delta(1-\theta^{\gamma/1-\gamma})$.

Therefore, this allows us to summarize the major effect of the multicultural integration in public education on the number and human capital levels of children that have been born to white parents with different levels of human capital.

Proposition 3: *Multicultural integration in public education that causes relatively skilled (wealthy) parents with human capital levels above* $\hat{h}$ *to resort to private education decreases fertility among these parents with human capital levels above* $\hat{h}$.

Proof. Proposition (2) in conjunction with Proposition 1(3).

This allows us to establish that multicultural integration in public education that increases the costs of having children as a result of the increase of the parental expenditures on their children's education for parents whose children flee public school is partly responsible for the extremely low levels of white fertility, which in itself has long been a subject of a serious public concern. Moreover, this fertility decline is concentrated in parents with higher human capital levels.

Proposition 4: *In contrast, among relatively less skilled (poor) parents with human capital levels below* $\hat{h}$, *who can not afford private education for their offspring,*

multicultural integration in public education decreases their children's human capital levels.

Proof. Proposition (2) in conjunction with Eq. (10), if $j = NF$. Note that in multicultural school $0 < \theta < 1$.

This allows us to establish that the integration policy in public education that has been designed for the benefit of less advantaged minority children generates a negative effect on the opportunities of the other weak segment of society – the offspring of the white poor.

Given that for parents with human capital levels above $\hat{h}$ their resort to the flight strategy implies an increase in the private parental expenditures on their children's education that, although at the expense of a reduction in the number of children, more than offsets the lost public education, this also allows us to shed new light on the effect of the integration on inequality among whites.

Proposition 5: *Multicultural integration in public education increases inequality among whites in the children's generation.*

Proof. Proposition (2) in conjunction with Proposition 1(2).

In addition, in view of the positive relationship between the parental human capital levels and their children's human capital levels, as shown in Eq. (10), this effect of integration may have long-lasting consequences.

Proceed now to the analysis of the losses of adult white individuals. Given the utility function in Eq. (2) and the results of optimization with respect to an adult's consumption in Eq. (5), these losses are calculated in terms of the lost potential future income of a white individual's children as a fraction of their potential incomes.

In order to calculate the lost potential income of a white individual's children, compute first the total potential income of the one's children in a potential case of a non-integrated public education. Denoting the potential non-integrated public education by $j = PNI$, the total potential income of the one's offspring in this case can be computed by multiplying the potential per-child level of human capital, as shown in Eq. (10), if $j = NF$ and $\theta = 1$, by the number of the one's children, as shown in Eq. (11), if $j = NF$. Subtracting from this potential level of the total income the real total income of the one's

offspring in the case of flight or in the case of no flight ($I_{t+1}^{N,PNI} - I_{t+1}^{N,j}$) and then dividing it by the potential total income of all the one's children in the potential case of a non-integrated public education ($I_{t+1}^{N,PNI}$), one can compute the fraction of the total potential income of a white individual's children that has been lost as a result of integration:

$$\frac{\Delta I_{t+1}^{N,j}}{I_{t+1}^{N,PNI}} \equiv \frac{I_{t+1}^{N,PNI} - I_{t+1}^{N,j}}{I_{t+1}^{N,PNI}} = \begin{cases} 1-\theta^{\gamma}, & \text{if } j = NF \\ 1-\left(1-(\alpha/\delta h_t)\right)^{1-\gamma}, & \text{if } j = F. \end{cases} \tag{13}$$

Given Eq. (13), I emphasize that:

Proposition 6: *The fraction of total potential income of a white individual's children that has been lost as a result of integration is higher among parents with human capital levels below* $\hat{h}$ *than among parents with human capital levels above* $\hat{h}$*, and among the latter it is higher the lower is the individual's level of human capital.*

Proof. Note that for any $h_t \geq \hat{h}$, $1-\theta^{\gamma} \geq 1-(1-(\alpha/\delta h_t))^{1-\gamma}$ and $1-(1-(\alpha/\delta h_t))^{1-\gamma}$ is decreasing in h_t.

Therefore, this allows us to conclude that among whites the poor, who can not afford to avoid the forcible integration, suffer from a higher negative effect than the rich, who can resort to the White Flight and lower their losses. This result may partly explain why negative sentiments toward several minorities are particularly strong among the less educated, as has been widely argued.

These findings appeal for a reassessment of the costs and benefits of the aggressive integration policy. The present analysis suggests that for a true evaluation of the society-wide effect of the integration policy it is not only necessary that the benefits of integration for the disadvantaged minorities should be appreciated, but also that the costs of integration for whites (and especially for the less prosperous among them) should equally not be ignored. As a result, the analysis suggest that, in order to minimize the society-wide losses, the interests of blacks in quality education might be better served by concentration on improving the quality of their schools, rather than by integration. In addition, an elimination of the adverse consequences of integration can also be conductive to a more just and peaceful coexistence in our modern multiethnic society.

3. Conclusion

This article analyzes the negative side of integration in public education – its effect on whites. I have used a standard model with endogenous fertility to show that the flight from integrated multicultural public schools to private education increases private educational expenditures and, as a result, decreases fertility among more affluent whites whose children flee. In contrast, among less prosperous parents, who can not afford private education for their offspring, multicultural integration in public education decreases their children's human capital levels. I also demonstrate that among whites the poor, who can not afford to avoid the forcible integration, suffer from a higher negative effect than the rich, who can resort to the White Flight and lower their losses, though at the expense of the reduction in the number of their children.

The present analysis suggest that for a true evaluation of the society-wide effect of the integration policy it is not only necessary that the benefits of integration for the disadvantaged minorities should be appreciated, but that the costs of integration for whites (and especially, for less prosperous among them) should equally not be ignored. As a result, the interests of blacks in quality education might therefore be better served by improving the quality of their education, rather than by integration.

References

Alesina A, Baqir R, Easterly W (1999) Public goods and ethnic division. *Quarterly Journal of Economics* 114, 1243–1284

Andrews KT (2002) Movement–countermovement dynamics and the emergence of new institution: the case of 'White Flight' schools in Mississippi. *Social Forces* 80, 911–936

Azarnert LV (2004) Redistribution, fertility, and growth: the effect of the opportunities abroad. *European Economic Review* 48, 785–795

Azarnert LV (2006) Child mortality, fertility and human capital accumulation. *Journal of Population Economics* 19, 285–297

Azarnert LV (2008a) Foreign aid, fertility and human capital accumulation. *Economica* 75, 766 – 781

Azarnert LV (2008b) Free education, fertility and human capital accumulation. *Journal of Population Economics* (forthcoming)

Azarnert LV (2009) Juvenile imprisonment and human capital investment. *Journal of Economic Inequality* (forthcoming)

Bagley C (1996) Black and White unite or flight? The racial dimension of schooling and parental choice. *British Educational Research Journal* 22, 569–580

Benabou R (1996) Equity and efficiency in human capital investment: the local connection. *Review of Economic Studies* 63, 237–264

Benabou R (2002) Tax and education policy in a heterogeneous-agent economy: what levels of redistribution maximize growth and efficiency? *Econometrica* 70, 481–517

Betts JR, Fairlie RW (2001) Explaining ethnic, racial, and immigrant differences in private school attendance. *Journal of Urban Economics* 50, 26–51

Betts JR, Fairlie RW (2003) Does immigration induce "Native Flight" from public schools into private schools? *Journal of Public Economics* 87, 987–1012

Clotfelter CT (1976) School desegregation, 'tipping', and private school enrollment. *Journal of Human Resources* 22, 29–50

Clotfelter CT (2001) Are Whites still fleeing? Racial patterns and enrollment shifts in urban public schools, 1987 – 1996. *Journal of Policy Analysis and Management* 20, 199–221

Coleman JS, Hoffer T, Kilgore S (1982) *High school achievement: public, catholic, and private school compared*. New York: Basic Books

Conlon JR, Kimenyi MS (1991) Attitudes towards race and poverty in the demand for private education: the case of Mississippi. *Review of Black Political Economy* 20, 5–22

De la Croix D, Doepke M (2007) To segregate or to integrate: education politics and democracy. *NBER*, wp. 13319

Epple D, Figlio D, Romano R (2004) Competition between private and public schools: testing stratification and pricing predictions. *Journal of Public Economic* 88, 1215–1245

Fairlie RW (2002) Private schools and "Latino Flight" from black schoolchildren. *Demography* 39, 655–674

Fairlie RW, Resch AM (2002) Is there "White Flight" into private schools? Evidence from the National Educational Longitudinal Survey. *Review of Economics and Statistics* 84, 21–33

Freeman RB (1994) Crime and the job market. *NBER* working paper 4910

Galor O (2005) From stagnation to growth: unified growth theory. In Aghion P, Durlauf S (eds.) *Handbook of Economic Growth*, North Holland, Amsterdam: Elsevier, Vol. 1A, pp. 171–295

Lankford H, Wyckoff J (2001) Who would be left behind by enhanced private school choice? *Journal of Urban Economics* 50, 288–312

Lankford H, Wyckoff J (2006) The effect of school choice and residential location on the racial segregation of students. In Gronberg TJ, Jensen DW (eds.) *Advances in Applied Microeconomics*, North Holland: Amsterdam, Vol. 14, pp. 185–239

Nechyba TJ (2003) School finance, spatial income segregation, and the nature of communities. *Journal of Urban Economics* 54, 61–88

Reber SJ (2005) Court-ordered disintegration successes and failures integrating American schools since Brown versus Board of Education. *Journal of Human Resources* 40, 559–590

Bar-Ilan University
Department of Economics
WORKING PAPERS

1-01 **The Optimal Size for a Minority**

Hillel Rapoport and Avi Weiss, January 2001.

2-01 **An Application of a Switching Regimes Regression to the Study of Urban Structure**

Gershon Alperovich and Joseph Deutsch, January 2001.

3-01 **The Kuznets Curve and the Impact of Various Income Sources on the Link Between Inequality and Development**

Joseph Deutsch and Jacques Silber, February 2001.

4-01 **International Asset Allocation: A New Perspective**

Abraham Lioui and Patrice Poncet**,** February 2001.

5-01 **מודל המועדון והקהילה החרדית**

יעקב רוזנברג, פברואר 2001.

6-01 **Multi-Generation Model of Immigrant Earnings: Theory and Application**

Gil S. Epstein and Tikva Lecker, February 2001.

7-01 **Shattered Rails, Ruined Credit: Financial Fragility and Railroad Operations in the Great Depression**

Daniel A. Schiffman, February 2001.

8-01 **Cooperation and Competition in a Duopoly R&D Market**

Damiano Bruno Silipo and Avi Weiss, March 2001.

9-01 **A Theory of Immigration Amnesties**

Gil S. Epstein and Avi Weiss, April 2001.

10-01 **Dynamic Asset Pricing With Non-Redundant Forwards**

Abraham Lioui and Patrice Poncet, May 2001.

11-01 **Macroeconomic and Labor Market Impact of Russian Immigration in Israel**

Sarit Cohen and Chang-Tai Hsieh, May 2001.

Electronic versions of the papers are available at
http://www.biu.ac.il/soc/ec/wp/working_papers.html

12-01 **Network Topology and the Efficiency of Equilibrium**

Igal Milchtaich, June 2001.

13-01 **General Equilibrium Pricing of Trading Strategy Risk**

Abraham Lioui and Patrice Poncet, July 2001.

14-01 **Social Conformity and Child Labor**

Shirit Katav-Herz, July 2001.

15-01 **Determinants of Railroad Capital Structure, 1830–1885**

Daniel A. Schiffman, July 2001.

16-01 **Political-Legal Institutions and the Railroad Financing Mix, 1885–1929**

Daniel A. Schiffman, September 2001.

17-01 **Macroeconomic Instability, Migration, and the Option Value of Education**

Eliakim Katz and Hillel Rapoport, October 2001.

18-01 **Property Rights, Theft, and Efficiency: The Biblical Waiver of Fines in the Case of Confessed Theft**

Eliakim Katz and Jacob Rosenberg, November 2001.

19-01 **Ethnic Discrimination and the Migration of Skilled Labor**

Frédéric Docquier and Hillel Rapoport, December 2001.

1-02 **Can Vocational Education Improve the Wages of Minorities and Disadvantaged Groups? The Case of Israel**

Shoshana Neuman and Adrian Ziderman, February 2002.

2-02 **What Can the Price Gap between Branded and Private Label Products Tell Us about Markups?**

Robert Barsky, Mark Bergen, Shantanu Dutta, and Daniel Levy, March 2002.

3-02 **Holiday Price Rigidity and Cost of Price Adjustment**

Daniel Levy, Georg Müller, Shantanu Dutta, and Mark Bergen, March 2002.

4-02 **Computation of Completely Mixed Equilibrium Payoffs**

Igal Milchtaich, March 2002.

5-02 **Coordination and Critical Mass in a Network Market – An Experimental Evaluation**

Amir Etziony and Avi Weiss, March 2002.

6-02 **Inviting Competition to Achieve Critical Mass**

Amir Etziony and Avi Weiss, April 2002.

7-02 **Credibility, Pre-Production and Inviting Competition in a Network Market**

Amir Etziony and Avi Weiss, April 2002.

8-02 **Brain Drain and LDCs' Growth: Winners and Losers**

Michel Beine, Fréderic Docquier, and Hillel Rapoport, April 2002.

9-02 **Heterogeneity in Price Rigidity: Evidence from a Case Study Using Micro-Level Data**

Daniel Levy, Shantanu Dutta, and Mark Bergen, April 2002.

10-02 **Price Flexibility in Channels of Distribution: Evidence from Scanner Data**

Shantanu Dutta, Mark Bergen, and Daniel Levy, April 2002.

11-02 **Acquired Cooperation in Finite-Horizon Dynamic Games**

Igal Milchtaich and Avi Weiss, April 2002.

12-02 **Cointegration in Frequency Domain**

Daniel Levy, May 2002.

13-02 **Which Voting Rules Elicit Informative Voting?**

Ruth Ben-Yashar and Igal Milchtaich, May 2002.

14-02 **Fertility, Non-Altruism and Economic Growth: Industrialization in the Nineteenth Century**

Elise S. Brezis, October 2002.

15-02 **Changes in the Recruitment and Education of the Power Elitesin Twentieth Century Western Democracies**

Elise S. Brezis and François Crouzet, November 2002.

16-02 **On the Typical Spectral Shape of an Economic Variable**

Daniel Levy and Hashem Dezhbakhsh, December 2002.

17-02 **International Evidence on Output Fluctuation and Shock Persistence**

Daniel Levy and Hashem Dezhbakhsh, December 2002.

1-03 **Topological Conditions for Uniqueness of Equilibrium in Networks**

Igal Milchtaich, March 2003.

2-03 **Is the Feldstein-Horioka Puzzle Really a Puzzle?**

Daniel Levy, June 2003.

3-03 **Growth and Convergence across the US: Evidence from County-Level Data**

Matthew Higgins, Daniel Levy, and Andrew Young, June 2003.

4-03 **Economic Growth and Endogenous Intergenerational Altruism**

Hillel Rapoport and Jean-Pierre Vidal, June 2003.

5-03 **Remittances and Inequality: A Dynamic Migration Model**

Frédéric Docquier and Hillel Rapoport, June 2003.

6-03 **Sigma Convergence Versus Beta Convergence: Evidence from U.S. County-Level Data**

Andrew T. Young, Matthew J. Higgins, and Daniel Levy, September 2003.

7-03 **Managerial and Customer Costs of Price Adjustment: Direct Evidence from Industrial Markets**

Mark J. Zbaracki, Mark Ritson, Daniel Levy, Shantanu Dutta, and Mark Bergen, September 2003.

8-03 **First and Second Best Voting Rules in Committees**

Ruth Ben-Yashar and Igal Milchtaich, October 2003.

9-03 **Shattering the Myth of Costless Price Changes: Emerging Perspectives on Dynamic Pricing**

Mark Bergen, Shantanu Dutta, Daniel Levy, Mark Ritson, and Mark J. Zbaracki, November 2003.

1-04 **Heterogeneity in Convergence Rates and Income Determination across U.S. States: Evidence from County-Level Data**

Andrew T. Young, Matthew J. Higgins, and Daniel Levy, January 2004.

2-04 **"The Real Thing:" Nominal Price Rigidity of the Nickel Coke, 1886-1959**

Daniel Levy and Andrew T. Young, February 2004.

3-04 **Network Effects and the Dynamics of Migration and Inequality: Theory and Evidence from Mexico**

David Mckenzie and Hillel Rapoport, March 2004.

4-04 **Migration Selectivity and the Evolution of Spatial Inequality**

Ravi Kanbur and Hillel Rapoport, March 2004.

5-04 **Many Types of Human Capital and Many Roles in U.S. Growth: Evidence from County-Level Educational Attainment Data**

Andrew T. Young, Daniel Levy and Matthew J. Higgins, March 2004.

6-04 **When Little Things Mean a Lot: On the Inefficiency of Item Pricing Laws**

Mark Bergen, Daniel Levy, Sourav Ray, Paul H. Rubin and Benjamin Zeliger, May 2004.

7-04 **Comparative Statics of Altruism and Spite**

Igal Milchtaich, June 2004.

8-04 **Asymmetric Price Adjustment in the Small: An Implication of Rational Inattention**

Daniel Levy, Haipeng (Allan) Chen, Sourav Ray and Mark Bergen, July 2004.

1-05 **Private Label Price Rigidity during Holiday Periods**

Georg Müller, Mark Bergen, Shantanu Dutta and Daniel Levy, March 2005.

2-05 **Asymmetric Wholesale Pricing: Theory and Evidence**

Sourav Ray, Haipeng (Allan) Chen, Mark Bergen and Daniel Levy, March 2005.

3-05 **Beyond the Cost of Price Adjustment: Investments in Pricing Capital**

Mark Zbaracki, Mark Bergen, Shantanu Dutta, Daniel Levy and Mark Ritson, May 2005.

4-05 **Explicit Evidence on an Implicit Contract**

Andrew T. Young and Daniel Levy, June 2005.

5-05 **Popular Perceptions and Political Economy in the Contrived World of Harry Potter**

Avichai Snir and Daniel Levy, September 2005.

6-05 **Growth and Convergence across the US: Evidence from County-Level Data (revised version)**

Matthew J. Higgins, Daniel Levy, and Andrew T. Young , September 2005.

1-06 **Sigma Convergence Versus Beta Convergence: Evidence from U.S. County-Level Data (revised version)**

Andrew T. Young, Matthew J. Higgins, and Daniel Levy, June 2006.

2-06 **Price Rigidity and Flexibility: Recent Theoretical Developments**

Daniel Levy, September 2006.

3-06 **The Anatomy of a Price Cut: Discovering Organizational Sources of the Costs of Price Adjustment**

Mark J. Zbaracki, Mark Bergen, and Daniel Levy, September 2006.

4-06 **Holiday Non-Price Rigidity and Cost of Adjustment**

Georg Müller, Mark Bergen, Shantanu Dutta, and Daniel Levy. September 2006.

2008-01 **Weighted Congestion Games With Separable Preferences**

Igal Milchtaich, October 2008.

2008-02 **Federal, State, and Local Governments: Evaluating their Separate Roles in US Growth**

Andrew T. Young, Daniel Levy, and Matthew J. Higgins, December 2008.

2008-03 **Political Profit and the Invention of Modern Currency**

Dror Goldberg, December 2008.

2008-04 **Static Stability in Games**

Igal Milchtaich, December 2008.

2008-05 **Comparative Statics of Altruism and Spite**

Igal Milchtaich, December 2008.

2008-06 **Abortion and Human Capital Accumulation: A Contribution to the Understanding of the Gender Gap in Education**

Leonid V. Azarnert, December 2008.

2008-07 **Involuntary Integration in Public Education, Fertility and Human Capital**

Leonid V. Azarnert, December 2008.