

# Public Schooling, Social Capital and Growth

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## **Abstract**

We consider the contribution of public education to growth through its role in building social capital—instilling common values and norms that lower economic transaction costs and reduce social tensions between different population groups. This is modeled in the context of a political economy framework that focuses on the role of public education in reducing redistributive rent-seeking. Our analysis shows that the social compromises needed to mobilize popular support for public education are more difficult to achieve the deeper are the cultural divisions in society; and that a uniform public school system, when adopted, promotes stronger growth than would a private system.

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## 1 Introduction

Although education does not have the technical attributes of a public good—it is both appropriable and divisible—public education, especially at the primary and high school levels (K-12), enjoys wide political support in almost all countries. Several recent efforts seek to explain this in terms of the instrumental role of education in building human capital, now widely recognized as an essential production factor of national output.<sup>1</sup> Studies in this vein highlight the potential benefits of government intervention as a means of internalizing the external benefits of education, relaxing credit constraints, and redistributing income.<sup>2</sup> Yet these are essentially arguments for public *financing* of education, rather than for public *provision*. The benefits they attribute to public education can be realized through less intrusive means than the uniform, publicly administered school systems so often observed, e.g., through the use of subsidies or vouchers. This suggests that there may be other advantages to public provision of education, largely neglected in this literature, which might better serve to explain its broad support. These advantages, we argue in this paper, do not derive from the instrumental role of education in building *human* capital, through the transmission of knowledge and skills, but from its normative role in building *social* capital. Public schooling instills common cultural norms and ethical values that lower economic transaction costs and reduce social tensions between different population groups. This normative aspect of education requires the direct controls of a publicly administered schooling system (Lott, 1990; Kremer and Sarychev, 1998).

The economic benefits of normative education work in a variety of ways. Instilling civic virtues from an early age through public schooling reduces future enforcement costs. Relatedly, uniform public schooling in a common culture generates network externalities by reducing transaction costs and thus facilitating economic activity—differences in language, custom or

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<sup>1</sup> This applies both to the proponents of endogenous growth theory, from Romer (1986) and Lucas (1988) on, and to those who question its necessity, e.g., Mankiw, Romer and Weil (1992).

<sup>2</sup> Papers which focus, like we do, on the political economy aspects include Benabou (1996), Boldrin (1993), Glomm and Ravikumar (1992), Fernandez and Rogerson (1999), Gradstein and Justman (1997).

religion can give rise to misunderstandings that undermine the efficiency of production and exchange. Yet a third benefit of social cohesion derives from the potential for redistributive conflict among distinct ethnic, cultural or religious groups. Uniform public schooling is a means by which the parent generation can effectively reduce the likelihood of such conflict in the following generation. Collectively, parents can contribute to the economic welfare of their children by broadening their cultural base, though this is not without cost: the traditional values in which the parents themselves were raised are diluted, weakening the link between parent and child, and the specific social capital of the component group is sacrificed.

This emphasis on the normative role of education is strongly reflected in historical experience. The role of education in building social capital was often a prominent motive for developing public education systems. The oldest recorded system of a universal (male) public education, dating back nearly two thousand years, is ascribed in the Talmud to the High Priest Joshua b. Gamla, in the generation preceding the destruction of the Second Temple, "... for but for him the Torah would have been forgotten from Israel. For at first if a child had a father his father taught him, and if he had no father he did not learn at all ... At length Joshua b. Gamla came and ordained that teachers of young children should be appointed in each district and each town, and that children should enter school at the age of six or seven." (Babylonian Talmud, Baba Bathra, 21a). The children were taught to read, understand and memorize Biblical texts, mostly from the Torah. Teachers were under the supervision of the rabbinical court and the scholars, and could be dismissed without warning if they failed to perform their duties adequately.<sup>3</sup> Parents were expected to pay for their children's instruction, but needy cases were supported from the public purse (Steinsaltz, 1989).<sup>4</sup> This education system, which persisted in varying forms throughout the Jewish Diaspora, clearly had an instrumental

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<sup>3</sup> There are detailed injunctions regarding class size, restrictions on the harshness of punishment, and a vivid discussion of whether a teacher who covers a lot of ground but makes mistakes is preferable to one who is slower but more precise.

dimension in its contribution to literacy levels. But this was an ancillary effect. Its primary contribution was to social capital, to maintaining a community of norms and values, and internalizing a system of adjudication.<sup>5</sup>

The earliest examples of modern public education date back to the eighteenth century, to the absolute monarchies of Frederick the Great in Prussia and Maria–Theresa in Austro–Hungary (Lamberti, 1989). Building on an existing infrastructure of voluntary religious education, their purpose was to instill duty and devotion in their subjects. Less authoritarian regimes subscribe to different agendas, but similarly seek to instill a sense of civic duty and internalize ethical norms and reduce the cost of enforcing any rule of law. Several decades after the introduction of public schooling in Prussia, a centralized, highly regimented education system began to play such a role in France. The *Loi Guizot* of 1833 laid the foundation for active State involvement in schooling. “The school reform, conceived at a time when France was preparing to make a new beginning and to train future generations in a new manner, was designed to foster social cohesion...” (Jardin, 1983, p. 113). In both Prussia and France public supervision and control of schooling predated full public financing by several decades (Green, 1990). In both, the wide dissemination of a secular ideology is credited with playing a key role in industrialization (Gerschenkron, 1962).

In democracies, literacy is essential in itself for the informed behavior of the electorate, on which the proper functioning of democracy relies. This link between democratization and education is especially apparent in England, where public schooling followed on the extension of the political franchise to the working classes in the Second Reform Act of 1867 and the Third Reform Act of 1884–88. With the Education Act of 1870, “the education of the English poor

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<sup>4</sup> As with subsequent systems of religious education, public administration of the education system, rather than public finance, was the predominant mode of intervention.

<sup>5</sup> It may have contributed to close commercial ties among Jewish medieval traders, which have recently been studied in Greif (1989).

became for the first time the direct concern of the nation” (Dicey, 1914, p.277).<sup>6</sup> This role of education as an integrating force shaping the modern industrial nation-state was yet more accentuated in countries that attracted large numbers of immigrants (Green, 1990). Thus the primary goal behind the spread of public primary education in the United States in the mid-nineteenth century was to help newly arrived immigrants acquire not only language skills but also the norms of social behavior, the rules of democracy, and the discipline of the modern industrial economy (Edwards and Richey, 1963; Bowles and Gintis, 1976).

Public education has also played an important role in the process of nation building in many multi-ethnic developing countries that gained their independence after World War II. Singapore is a case in point. Under colonial rule, education in Singapore was ethnically segregated, its level and contents varying across population groups, but after independence the government unified the different education streams and aggressively promoted universal public schooling, with English as a common official language. This facilitated communication between the different ethnic groups, and while cultural differences remain, potentially destructive ethnic conflict has been avoided (Thomas et al., 1980). In contrast, some of the more ethnically diverse African countries, were unable to find a common ground on which to base a unified school curriculum—in terms of language, culture, and social norms. In these countries, where public education was not successful in promoting social cohesion, a high degree of mistrust among different ethnic groups remains a misfortunate reality, often flaring up in violent conflict (Easterly and Levine, 1997).

The empirical significance of the contribution of social capital to growth was recently demonstrated by Knack and Keefer (1997), La Porta et al., (1997), and Temple and Johnson (1998), reviving an approach first set out by Adelman and Morris (1967). These studies show

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<sup>6</sup> As in other countries, the compulsory public system built on the foundations of pre-existing voluntary schooling. Coleman’s findings suggest that at mid-century 50-60% of children aged 5-9 attended school, roughly half of them in schools supported by religious bodies. Note that public schooling was made compulsory more than ten years before the legislation of public responsibility for its financing.

that high levels of trust and social participation are positively correlated with growth, after controlling for other growth-promoting factors. Conversely, ethnic heterogeneity in populations comprising rival groups harboring a large degree of mutual mistrust and animosity, is often associated with costly struggles over power and resources that are detrimental for growth.<sup>7</sup>

The present paper integrates the various strands of the literature by theoretically elaborating the contribution of public schooling to growth through its role in reducing redistributive rent seeking between competing ethnic groups, in the context of a political economy model.<sup>8</sup> We begin by considering the political decisions that determine whether a single uniform education system is adopted, or whether each ethnic group has its own school system. We then specify the redistributive rent-seeking activities that arise when separate school systems accentuate ethnic differences, and trace out their subsequent implications for economic growth.

## 2 Assumptions

We assume a two-period economy populated by a continuum of households each consisting of a parent and a child. Parents are exogenously endowed with social characteristics—language, culture, ideology. Assume for simplicity that the parent generation is divided into just two uniform groups, “reds” and “greens”, denoted by the index  $j = r, g$ , and that the reds constitute a majority. Denote the proportion of reds to greens by  $\gamma$  ( $\gamma > 1$ ), so that the measure of individuals in each period is  $1 + \gamma$ . Assume that social characteristics are captured by a single parameter,  $d_j$ ,  $j = r, g$ , where  $0 \leq d_j \leq 1$ , and that the two groups have different characteristics,  $d_r \neq d_g$ . (We will

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<sup>7</sup> In a different context, Alesina et al. (1997) argue that ethnic heterogeneity leads to a low supply of public goods in the context of the US communities; and Alesina and La Ferrara (1999) find that social participation is lower in ethnically fragmented societies.

<sup>8</sup> Tornell and Lane (1999) highlight the detrimental effect on growth of conflicts deriving from competitive rent seeking among ethnic groups, but do not consider the potential role of public education in smoothing out these tensions.

use culture and ideology interchangeably when talking about these social characteristics.) To focus on essentials assume further that all parents are endowed with the same initial income,  $w$ .

Parents decide on the cultural orientation of their children's schooling, and on the division of their initial endowment between current consumption and "instrumental" investment in their children's human capital. Thus schooling endows the child with a level of human capital,  $h_j$ , and determines its social orientation,<sup>9</sup> which we denote  $s_j$ ,  $j = r, g$ . The cultural distance between parent and child is then  $|d_j - s_j|$ , and we assume that reducing this distance is beneficial to parents' utility.<sup>10</sup> To fix ideas, assume parents' utility has the following quasi-linear form:

$$U(c_{j1}, c_{j2}, |d_j - s_j|) = u(c_{j1}) + c_{j2} - |d_j - s_j| \quad (1)$$

where  $c_{j1}$  denotes current consumption,  $c_{j2}$  denotes next-generation consumption, and  $u$  is monotonically increasing and concave.

We restrict our attention to two possible school systems: a private system that preserves parents' distinct cultural identities in the next generation, or a single uniform school system that obliterates them. We assume that the majority reds determine the social orientation of the public education system and its level of investment in human capital, but cannot coerce the minority greens to participate in it or pay for it.<sup>11</sup> In other words, the reds offer a social orientation,  $d$ , and human capital level  $h$ , and the greens can either accept or reject it. If the greens accept the reds' offer, we have uniform, universal *public schooling* on these terms; if they reject it, we have *private*

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<sup>9</sup> In reality, of course, home environment is also an important input in a child's education, and although public schooling emphasizes common norms the result is never completely homogenous. Thus a child might learn a local dialect at home in addition to the official language taught at school.

<sup>10</sup> See Bisin and Verdier (1997) for a more detailed economic perspective on the disutility of having a child different from oneself.

<sup>11</sup> Equivalently, those parents whose choose to opt out from public schools are assumed to be getting a full tax credit. One could also consider partial tax credit for those opting out of public education, or no credit at all, as is the case in the US. The allocation of the education financing burden can be viewed as a constitutional issue, which is determined at an earlier stage and depends on the relative political power of the population groups. These possibilities are not discussed here, but deserve further study.

*schooling*.<sup>12</sup> While private schooling offers the advantage of minimizing the cultural distance between parent and child, by perpetuating distinct cultural identities it carries the disadvantage of promoting inefficient redistributive rent-seeking activities between the two group in the next generation, each group marshalling wasteful effort to gain what it can. The advantage of a single uniform school system is that it allows these efficiency losses to be avoided.<sup>13</sup>

Whichever school system is chosen, parents fully finance the schooling of their own children from their initial endowment, allocating it between current consumption,  $c_{j1}$ , and investment in human capital,  $h_j$ :

$$w = c_{j1} + h_j \tag{2}$$

This investment determines next-period *gross* income,  $y_j$ , through a linear production technology,<sup>14</sup>

$$y_j = h_j \tag{3}$$

However, *net* income, which equals next-generation consumption, is also affected by redistributive rent-seeking activities determined by the social capital that parents pass on to their children.

In explicitly modeling these redistributive rent-seeking activities we follow a standard approach (see, e.g., Becker, 1983). We make the simplifying assumption that each of the two groups is able to completely overcome internal free riding incentives, each determining

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<sup>12</sup> There are other assumptions one could make regarding the type of alternative systems that is adopted, e.g., one could have sectoral school systems for either or both groups.

<sup>13</sup> An alternative source of inefficiency deriving from heterogeneity, which we do not pursue here, is technological, and relies on the premise that individual productivity decreases with group heterogeneity, e.g., because of communication difficulties. Of course, there are also advantages in a heterogeneous population: people brought up in different ways may have complementary perspectives that are mutually enriching. Nevertheless, there is evidence that at least in some contexts the overall effect is detrimental. Recent experience in former Yugoslavia offers several tragic illustrations. Easterly and Levine (1997) show the negative impact on growth of ethnic struggles in many African countries. But the adverse effects of heterogeneity can be experienced without explicit military conflict, e.g., in the detrimental effect of nonviolent political struggle over resources between racial groups in local US communities (Alesina et al., 1997; Alesina and La Ferrara, 1999)

<sup>14</sup> For notational simplicity, the technology parameter is set uniformly equal to 1, but in general, it may differ across groups or individuals.



collectively the amount of individual rent seeking effort it wishes to expend. We assume that there is a share,  $0 < \alpha < 1$ , of second-period individual gross income, which is protected by the prevailing system of property rights, with the remaining unprotected share exposed to redistributive rent seeking. Recalling that gross income is equivalent to human capital,  $\alpha h_j$  represents the amount of protected income of an individual of group  $j$ ; and  $(1-\alpha)H$  is the total amount of second period income available for redistribution, where  $H$  denotes the total amount of investment in instrumental human capital.

Let  $x_r$  and  $x_g$  denote the respective rent seeking efforts of individuals in each of the two groups. Let  $S(\gamma x_r, x_g)$  denote the proportion of the unprotected share of national income that accrues to the red group, where  $S$  is increasing in its first argument and decreasing in its second; then  $1 - S(\gamma x_r, x_g)$  is the proportion that accrues to the green group. To simplify the derivations we assume that  $S$  takes the functional form  $S(\gamma x_r, x_g) = \gamma x_r / (\gamma x_r + x_g)$ , normalizing so that  $S(0,0) = \gamma / (\gamma + 1)$ . In particular, note that when all members of the two groups exert identical positive effort, the more numerous reds are able to capture a larger fraction of resources. The proceeds from redistribution are allocated equally between the group's members. Finally, let  $b_j$  denote the marginal cost which group  $j$  incurs in mobilizing resources for rent seeking purposes; we assume that it is inversely related to group size, so that  $b_r = 1/\gamma$ , and  $b_g = 1$ . With these assumptions, and recalling equation (3), net income, hence consumption, in the second generation is given by:

$$c_{r2} = \alpha h_r + (1 - \alpha) H x_r / (\gamma x_r + x_g) - x_r / \gamma \quad (4a)$$

$$c_{g2} = \alpha h_g + (1 - \alpha) H x_g / (\gamma x_r + x_g) - x_g \quad (4b)$$

### 3 Analysis

#### 3.1 Private schooling

We proceed backwards, starting with the analysis of redistribution in the next generation. In the private schooling case, heterogeneity persists in the next generation, so that each of the two groups exerts pressure to redistribute in its favor. They then choose  $x_r$  and  $x_g$  so as to maximize (4a) and (4b) respectively. Simple analysis then reveals that, the difference in group size notwithstanding, each individual in the two groups exerts the same amount of rent-seeking effort:  $x_r = x_g = (1 - \alpha) H \gamma / (1 + \gamma)^2$ . Substitution back into (4a) and (4b) yields:

$$c_{r2} = \alpha h_r + (1 - \alpha) H \gamma / (1 + \gamma)^2 \quad (5a)$$

$$c_{g2} = \alpha h_g + (1 - \alpha) H / (1 + \gamma)^2 \quad (5b)$$

Anticipating the next period struggle the parents invest in the human capital – both in the instrumental aspect and in the cultural aspect - of their children so as to maximize their utilities. Clearly, optimization requires bringing up the child in one's own tradition,  $s_j = d_j$ . We then turn to the determination of instrumental human capital investment by the parents. Each parent undertakes this investment so as to maximize his utility subject to the budget constraint and (5). The resulting first order conditions at the internal equilibrium are:

$$-u'(w - h_j) + \alpha = 0 \quad (6)$$

for  $j = r, g$ . It follows that both groups invest equally in human capital; denote this level  $h_0$ . However, the majority reds derive more second-period consumption, and hence greater utility, from their investment because of their advantage in rent seeking. Total differentiation of (6) further reveals that investment is an increasing function of  $\alpha$ : better protection of property rights increases overall investment. Letting  $U_{j0}$  denote the utility level of a group  $j$  parent under private schooling, we then obtain

$$U_{r0} = u(w - h_0) + [\alpha + (1 - \alpha) \gamma / (\gamma + 1)] h_0 \quad (7a)$$

$$U_{g0} = u(w - h_0) + [\alpha + (1 - \alpha) / (\gamma + 1)] h_0 \quad (7b)$$

Differentiating (7) with respect to  $\alpha$ , and invoking (6), we obtain that both groups benefit from stronger property rights. Summarizing:

*Proposition 1.* In a private school system better protection of property rights increases parental investment in instrumental schooling in both the majority and the minority, and increases parents' utility in both groups.

### 3.2. Public schooling

Now consider universal, uniform public education. Its social orientation,  $s^*$ , and level of instrumental human capital,  $h^*$ , are chosen by the red majority and accepted by the green minority. As all children share a common culture there is no basis for wasteful rent-seeking effort. Consequently (and as all parents are endowed with the same initial income,  $w$ ), there is unanimity regarding the desired level of instrumental human capital, derived by maximizing  $u(w - h) + h$ , i.e., and characterized by the first order condition:

$$-u'(w - h^*) + 1 = 0 \tag{8}$$

It follows from Proposition 1 that  $h^* > h_0$  (viewing public schooling as a limiting case of private schooling with full protection of property rights,  $\alpha = 1$ .) As  $h_0 > c_{j2}$  for  $j = r, g$ , we have:

*Proposition 2:* There is more investment and higher future income under public schooling than under private schooling.

The two groups are diametrically opposed regarding the social orientation of the public school system. Assume without loss of generality that  $d_r < d_g$ . Then the reds prefer as low a value as possible within the interval  $[d_r, d_g]$ , while the greens prefer as high a value as possible, and cannot be coerced into joining the public system. It follows that the values of  $s$  acceptable to minority parents are bounded from below by the greater utility from material goods that public schooling offers, compared with private schooling, and the lowest acceptable value of  $s$  is given by:

$$u(w - h^*) + h^* - (d_g - s) = u(w - h_0) + [\alpha + (1 - \alpha) / (\gamma + 1)] h_0 \quad (8)$$

If the solution of (8) is less than  $d_r$  then public schooling will surely be established, as the red majority must benefit from a public system that adopts its own cultural orientation. This may occur if property rights (represented by  $\alpha$ ) are weak, the reds' majority,  $\gamma$ , is large, and the cultural distance between reds and greens,  $d_g - d_r$ , is small. Otherwise, let  $s^*$  denote the solution of (8). Then public schooling is established if  $s^*$  also represents an improvement over private schooling for the red majority, i.e., if it satisfies

$$u(w - h^*) + h^* - (s^* - d_r) \geq u(w - h_0) + [\alpha + (1 - \alpha) \gamma / (\gamma + 1)] h_0 \quad (9)$$

Combining (8) and (9), we find that public schooling is feasible if

$$u(w - h^*) + h^* - u(w - h_0) - \frac{1}{2} (1 + \alpha) h_0 \geq \frac{1}{2} (d_g - d_r) \quad (10)$$

Inspection of (10) reveals again that a larger cultural distance between the two groups impedes the adoption of public schooling. Goldin and Katz (1998) provide some empirical support for this result. Focusing on the evolution of public (secondary) schooling in the US between 1910-1940, they find strongly positive relationship between public schooling and measures of social capital, and, in particular, proxies for social homogeneity. James (1993) finds similar effects

in a cross sectional analysis of countries: those with stronger religious divisions devote a larger share of resources to private education. Cohen-Zadeh and Justman (1999) find a similar effect among local communities in the US, after controlling for income levels and income distribution.

The relative power of the groups determines the orientation of the uniform public system. Equation (8) implies that  $s^*$  is decreasing in  $\gamma$ : the smaller the minority of the greens the greater their loss from rent-seeking conflict and hence the lower the value of  $s$  which they are willing to accept, i.e., the more they are willing to concede regarding the cultural orientation of the public school system. Equivalently, the larger the majority of the reds the closer will the social orientation of the public system conform to their own ideology. At the same time, however, a large majority gains more from rent-seeking behavior. Thus the relative size of the majority affects the decision to adopt public schooling in two opposing ways; in the current formulation the two effects cancel out, and relative size does not enter in equation (10). Finally, since the derivative of the left-hand side of (10) with respect to  $\alpha$  is negative (after applying the first-order condition in equation (6)), stronger property rights imply a smaller loss from rent-seeking activities and hence less of a gain from a uniform public school system.<sup>15</sup> More generally, public schooling serves in this context as a precommitment device against future conflict. If such conflict can be averted by other means, culturally specific schools that allow parents to educate their children in their own tradition, are preferable.<sup>16</sup> Summarizing:

*Proposition 3:*

1. Public schooling is more viable the less is polarization between the two groups.
2. The ideology of the public school system will be closer to that of the majority the larger its share in the population.

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<sup>15</sup> The large share of private schooling in the Netherlands, for example, is consistent with such an effect.

<sup>16</sup> In a related context, Gradstein (1999) argues for a similar role of public schooling when the source of potential social tensions is income inequality.

3. The stronger the system of property rights the smaller the advantage of public schooling.

## **4 Conclusion**

Historians of education systems emphasize the social value of schooling as a primary objective of public education. The emergence of public education is commonly attributed to goals associated with nation building: social cohesion, prevention of ethnic tensions and social conflicts, etc. The economic growth literature, while underscoring the importance of human capital accumulation, has largely disregarded this aspect of schooling. This, despite recent evidence that social capital—trust, voluntarism, social participation—measurably contributes to growth. This paper is an attempt to formally model the political choice to adopt public education as deriving from an appreciation of the ideological dimension of public schooling, and its potential contribution to growth. It is hoped that the paper’s arguments may help better understand the historical origins of public education as well as the more recent experiences of developing countries.

## References

- Adelman, I. and C.T. Morris (1967) *Society, politics, and economic development*. Baltimore, MD: Johns Hopkins University Press.
- Alesina, A., Baqir, R., and W. Easterly (1997) "Public goods and ethnic divisions," NBER WP 6009, forthcoming in *Quarterly Journal of Economics*.
- Alesina, A. and E. La Ferrara (1999) "Participation in heterogeneous communities," NBER WP 7155.
- Babylonian Talmud. English translation. London: Soncino.
- Becker, G.S. (1983) "A theory of competition among pressure groups for political influence" *Quarterly Journal of Economics* 98: 371-400.
- Benabou, R. (1996) "Heterogeneity, stratification, and growth: Macroeconomic implications of community structure and public finance" *American Economic Review* 89: 584-609.
- Bisin, A. and T. Verdier, "The economics of cultural transmission and the dynamics of preferences," DELTA WP 97-03.
- Boldrin, M., 1993, "Public education and human capital accumulation," DP 1017, Kellogg Graduate School of Management, Northwestern University.
- Bowles, S. and H. Gintis (1976) *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic life*. New York : Basic Books.
- Coleman, B. I. "The Incidence of Education in Mid-Century", pp. 397-410.
- Cohen-Zadeh, D. and M. Justman (1999) "Private Education and Income Distribution: Theory and Evidence", Monaster Center Discussion Paper, Beer Sheva: Ben Gurion University.
- Dacey, A. V. (1914) *Lectures on the Relation Between Law and Public Opinion in England During the Nineteenth Century*, 2<sup>nd</sup> ed. London: Macmillan, reissued in 1962.
- Easterly, W. and R. Levine (1997) "Africa's Growth Tragedy: Policies and Ethnic Divisions," *Quarterly Journal of Economics* 112: 1203-1250.
- Edwards, N. and H. C. Richey (1963) *The School in the American Social Order*. Boston: Houghton Mifflin.
- Fernandez, R. and R. Rogerson (1999) "Equity and resources: An analysis of education finance systems," <http://www.nber.org/papers/w7111>.
- Gerschenkron, A. (1962) *Historical Backwardness in Historical Perspective*. Cambridge, MA: Harvard University Press.
- Glomm, G. and B. Ravikumar (1992) "Public versus private investment in human capital: Endogenous growth and income inequality," *Journal of Political Economy* 100: 818-34.
- Goldin, C. and L.F. Katz (1998) "Human capital and social capital: The rise of secondary schooling in America, 1910 to 1940," NBER WP 6439.
- Gradstein, M. (1999) "An economic rationale for public education: The value of commitment," *Journal of Monetary Economics*, forthcoming.
- Gradstein, M. and M. Justman (1997) "Democratic choice of an education system: Implications for growth and income distribution" *Journal of Economic Growth* 3: 169-183.
- Green, A. (1990) *Education and State Formation*. New York: St. Martin's Press.

- Greif, A. (1989) "Reputation and coalitions in medieval trade: Evidence on the Maghribi traders," *Journal of Economic History*, 49: 857-882.
- Lamberti, M. (1989) *State, Society, and the Elementary School in Imperial Germany*. Oxford University Press.
- James, E. (1993) "Why do different countries choose a different public-private mix of educational services?" *Journal of Human Resources* 28:572-592.
- Jardin, A. (1983) *Restoration and reaction, 1815-1848*. Maison des Sciences de l'Homme and Cambridge University Press.
- Knack, S. and P. Keefer, "Does social capital have an economic payoff? A cross-country investigation," 1997, *Quarterly Journal of Economics*, 112, 207-27.
- Kremer, M. and A. Sarychev, "Why do governments operate schools?" 1998, mimeo.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R.W. Vishny, "Trust in large organizations," *American Economic Review*, 87(1997), 333-338.
- Lott, J. (1990) "An explanation for public provision of schooling: The importance of indoctrination," *Journal of Law and Economics* 33:199-231.
- Lucas, R.E., Jr. (1988) "On the mechanics of economic development," *Journal of Monetary Economics* 22: 3-42.
- Mankiw, N.G., Romer, D. and D.N. Weil, (1992) "A contribution to the empirics of economic growth," *Quarterly Journal of Economics*, 107:407-37.
- Romer, P.M. (1986) "Increasing returns and long-run growth," *Journal of Political Economy* 94: 1002-37.
- Saint-Paul, G. and T. Verdier (1993) "Education, democracy and growth," *Journal of Development Economics* 42: 399-407.
- Steinsaltz, A. (1989) *The Talmud: A Reference Guide*. New York: Random House.
- Temple, J. and P. A. Johnson (1998), "Social capability and economic growth," *Quarterly Journal of Economics* 113: 965-990.
- Thomas, R. M., G. K. Leong and R. W. Mosbergen (1980) "Singapore", in T. N. Postlethwaite and R. M. Thomas, eds. *Schooling in the Asean Region*, Oxford: Pergamon Press, pp. 184-223.
- Tornell, A. and P.R. Lane (1999) "The voracity effect," *American Economic Review*, 89, 22-46.