Economic and Social Infrastructure in the Strategy of Regional Economic Development: An Alternative Theoretical Perspective Relevant to Open Economies

by

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ABSTRACT

The purpose of this paper is to reformulate the problem of unemployment and its relation to education; i.e., to suggest a new conceptual perspective on this relationship. The major hypothesis is that the people of a low-income region with limited opportunities for educated persons interpret their local economic environment and its job opportunities as indicating the actual benefits of education, and hence undervalue it. This hypothesis is not tested in this paper, but examined as an indication of a direction for further research. An illustrative example which is representative of many other economically lagging regions is a 19-county area of South Central Kentucky, which has received much state and U.S. development assistance. This region is of special interest because demand for labor has rapidly increased and education is available, but unemployment remains stubbornly high and the level of education low. Therefore, it appears that a strategy of merely providing educational and employment opportunities and transportation infrastructure will not lift a lagging region out of poverty. Further research is needed, beginning with a re-examination and reformulation of the problem to include the impact of the social and economic environment created by the predominance of unskilled and non-technical jobs in the area. An alternative strategy which is relevant to an open economy is suggested if the hypothesis proves to be valid.
INTRODUCTION

Most major developed nations have important regional disparities in productivity and incomes. The regions which have lowest incomes are disproportionately rural and, in most cases, are viewed as objects of national policy concern. Large public income transfers are required to provide what are considered to be minimum acceptable levels of nutrition, housing, health services, educational opportunities and related amenities. The United States shares this problem of regional disparity. Like many other nations, U.S. efforts to alleviate regional inequalities have been relatively unsuccessful. What is wrong remains a puzzle after several decades of study and many policy initiatives. Evidently a major reformulation of the problem, and a re-examination of the theoretical frameworks which have guided the social science community in its researches, i.e., a generally fresh look -- unencumbered by the legacy of prior formulations -- is needed. This paper represents an attempt at such a reformulation.

While past formulations of the problem have failed in many regions and nations, it is equally evident that the reasons for failure vary. This paper attempts a reformulation which is applicable to one apparently rather pervasive problem configuration in the Southern United States - especially the Central Appalachian region. This problem configuration is shared by some other countries, but even in the U.S.A. it is by no means universal among less-developed regions.

In the United States, efforts to redress these regional disparities in the past three decades have emphasized two elements, a) the build up of physical infrastructure such as transportation systems, and b) subsidies of various kinds to, and direct recruitment of, industrial investors. Both were designed to attract industrial capital investment to regions of severe
under-employment. A large literature on industrial location and location incentives offered to industries has emerged (12)(17)(23)(24). During the 1970's major economic growth occurred in rural areas. In the aggregate, the growth of manufacturing industry in U.S. rural areas has slowed and even reversed during the 1980's. However, despite recession in the early 1980's, growth in numbers of employed persons continued with only short interruption in some areas, especially in Southern regions. One such region in the state of Kentucky will be used for illustrative purposes in this paper. Yet the region is still poor, its labor supply underutilized and its people under-educated.

**Education and Human Capital**

While scholars and policy-makers have focused primarily on infrastructure and decentralization of manufacturing industry, human capital -- and education's contribution to it -- has been given significant attention, especially to public investments in schooling. The literature on the economics of education is now a substantial one. It blossomed as a major focus of economic research in the 1960's (1)(2)(19)(20). High marginal rates of return to public and personal investment in schooling have been found to be almost universal. State governments have made major reforms in the organization and financing of educational systems over the past few decades. These reforms have undoubtedly increased the quality of educational services and the already high returns to these investments. They have also provided the public capital contributions for local school systems in disadvantaged areas to bring their educational financing nearer to the standards of the more affluent areas. Yet in some clearly defined regions the problem of seriously deficient amounts of schooling and rates of learning remains essentially untouched and rates of utilization of labor remain scandalously low. This situation provides the impetus for the reformula-
tion which is attempted in this paper. It is a reformulation which draws upon methodological analogy to Albert Hirschman's *The Strategy of Economic Development* (7)(25) and focuses on the economic, social and political externalities of the process of regional economic growth. Unlike the "Stages Model of Endogenous Regional Growth" of Coffey and Polese(4), this formulation in this paper is overtly instrumentalistic. It attempts to identify relationships which illuminate feasible ways to intervene in processes which have thus far failed to yield desired outcomes.

THE INADEQUACY OF PAST POLICIES AND THEORETICAL FORMULATIONS:
A CASE EXAMPLE

To illustrate the problem configuration for which a reformulation is attempted, we look at a nineteen-county area mainly in the Appalachian Region of Kentucky. The region has been intensively studied by the Economic Research Service of the United States Department of Agriculture, and more recently, by the University of Kentucky under financing from the Economic Research Service (11)(15)(16). Insights from both studies are foundations for the discussion which follows.¹

Up to 1970, manpower had been severely under-utilized in this area. In 1970 an estimated one-third of the labor supply was not being used at all.² But nearly doubled manufacturing and more than doubled total employment has taken place since 1970, along with a recovery of coal-mining employment following the O.P.E.C. oil episode in the mid-1970's. Coal mining employment has since declined, but was still three times as great in the 1980-84 period as in 1970 (See Table 1).

The 19-county region (see map, Fig. 1) lies almost entirely within the Appalachian Mountain chain and its foothills. While half a century ago it was rather inaccessible, the area is now served by a four-lane
Interstate highway, three (mostly two-lane) federal highways, a modern toll road, and a fairly well-developed set of state highways. Eleven of the counties have direct rail freight service. Current expenditures for schools in 1980-81 averaged $1117 per pupil, compared with $1,266 for the state as a whole, inclusive of metropolitan counties. Ninety-five percent of the school operating expenditures in the survey region were from state and federal government allocations (3). State government equalization measures have greatly narrowed the expenditure gap.

**Under-Utilized Labor:** Despite impressive rates of growth in employment and population after a long period of decline, the problem of under-utilization of labor remains essentially untouched. For the period 1979-84 estimated labor utilization was still approximately the same as in 1970 (16).³ Thirteen percent of persons who were continuously available for employment had not been employed full-time for a single month. A much more intensive survey of the core nine county area by the Economic Research service indirectly corroborated these findings, indicating that as many persons entered the ranks of the impoverished as left them (11,p.13).

**A Limitational Factor - Education**

By 1980-84, local employment opportunities were greatly expanded, and important components of transportation infrastructure and educational spending were reasonably adequate by most standards. But the failure to improve labor utilization or reduce poverty remains undiagnosed.

A probable limitational element in the situation is education. Even though school-bus transportation has become universally available and substantially more equitable financial support has been achieved, performance of the primary and secondary school system and utilization of educational services have lagged seriously. Of the students in the survey area entering the ninth grade, 44 percent did not graduate from grade 12 as of 1980.
-- 16 percent more than in non-Appalachian districts and 3 percent more than the entire Appalachian area of Kentucky. Learning rates as measured by standardized tests also were substantially below state norms (See Table 2).

Education has been greatly improved in the region, but problems remain. It is evident that the quality of educational services falls short of what could be achieved with current financial support. Widespread treatment of teaching appointments as objects of political patronage has been frequently charged, along with alleged misuse of school financial resources. Yet significant progress toward improvement in qualifications of teachers and general quality of services is apparent. Whether the gap between this and other areas of the state and nation has been reduced cannot readily be documented. But educational authorities generally concede that there is substantial opportunity for improvement in performance.

Clearly, then, growth of employment opportunities and increased external support of public education have not resulted in important improvement in labor utilization. Neither have they adequately enhanced stocks of developed human capital. Even though the historic out-migration of human resources from the area has been reversed, personal and public under-investment in education continues. The combined strategies of improved educational opportunities and job creation have failed to achieve their intended objectives of relieving poverty. New conceptual sightings on this old problem are obviously needed.

A GENERAL THEORETICAL INTERPRETATION

Put in theoretical perspective, what does this evidence suggest? Clearly, in the U.S. as a whole, the markets for existing stocks of human resources and industrial capital have apparently worked relatively efficie-
ntly, at least in the past two or three decades. From the end of World War II until the mid-1960's, excess labor resources in this Kentucky region migrated at extraordinarily rapid rates to urban areas. Population declined precipitously, but selectively, leaving a concentration of inferior grades of labor resources in the countryside, and unfavorable ratios of economically dependent (aged, infirm, and under-working-age) to economically productive persons. An early writer whose name escapes recall aptly termed this "folk-depletion."

Nobel prize winner Theodore W. Schultz's so-called "retardation hypothesis" (18) provided the rationale for many studies of the markets for labor in the 1950's and 1960's, one by the author (21)(22). The hypothesis was that the markets for labor and capital worked less efficiently at points geographically removed from urban-industrial centers. This hypothesis was a sub-species of central place theory, but it was framed in orthodox neoclassical concepts. Contrary to the view of Schultz and many others, the author included, the problem was not one of market failure. The total fund of evidence suggests that continued severe under-employment was traceable to stocks of labor resources which were ill-equipped for urban-industrial pursuits. Had this not been true, even more out-migration would have occurred. Moreover, during the post-1970 expansion period, return migration of large numbers of workers took place along with immigration from outside the region. As of 1985, the working-age people in the survey area who were born in the Appalachian Kentucky region had worked an average of almost three years outside that region (15; p.76).

Implicitly, the same flawed rationale has undergirded the more recent research on industrial location and responses to location incentives -- that is, re-allocation of industrial capital to regions of surplus and
potentially productive but immobile labor supplies (12)(17)(24)(25).\textsuperscript{5} The Appalachian Regional Commission, a regional development authority, has mobilized U.S. government financial support for this and other depressed parts of Appalachia, with heavy concentration on highways. States and communities work hard at attracting industries to their regions. Almost every state and almost every rural community of significant size in areas such as Appalachian Kentucky recruit potential employers through an official promotional office, a civic organization, or a development corporation. Most provide subsidies in the form of low-cost financing, tax abatement, plant building sites, etc. Clearly, the hypothesis of market failure has guided their policies.

Two assumptions are implicit in this line of research and policy strategy. The first assumption is that there are enough externalized benefits through linkages to other local sectors to justify the subsidies to industrial capital investments. The second is the assumption that these externalized benefits in labor surplus areas exceed those in other areas, so that these efforts are not zero-sum games. If the latter assumption were not true, metropolitan areas would offer sufficient counter-inducements to retain industries.

\textbf{Flawed Assessments Follow Flawed Assumptions}

So-called impact models have been used to test the assumptions about the externalities of industrial location in such areas, including fiscal impacts on governmental units. Economic base, input/output and simulation models have been developed. They have been widely used in the United States.\textsuperscript{(10)(13)(23)} Note, however, that all of these models are conceptually static and short-run in nature. There is no provision for analysis of long-term, inter-generational impacts on social and institutional structure or behavioral predispositions of the indigenous population.\textsuperscript{6} For
example, the private demand for and collective willingness to provide enhanced supplies of educational services is assumed to be given and fixed. It seems a classic analytical incongruity that static models are applied to analysis of inherently long-run, cumulative relationships. And these are the very core of development economics, if indeed, it is worthy of its name. But this is the situation, it appears.

It is also apparent that the hypothesis that human capital underinvestment explains much of regional retardation has come to the surface again. The incursions of the Japanese manufacturing goods into domestic U.S. markets has brought this hypothesis to the forefront in U.S. national politics. Recent state political controversies have centered on the issue of whether improvements in educational services or industrial recruitment programs should receive priority in state budgetary allocations. But, as noted earlier, success in past efforts to upgrade educational performance through greater infusions of government funds has proven to be limited up to this time.

ASSUMPTIONS UNDERLYING THE HUMAN CAPITAL HYPOTHESIS

To diagnose the nature of the malfunction which has been described, it will be useful to review very briefly the conventional theoretical formulation and the assumptions on which it is based. In doing so it is necessary to consider both the private demand for educational services and the public sector supply of these services.

The Public Supply of Educational Services

The supply of educational inputs is determined collectively by joint action of public entities -- local, state and national. The same individuals (families) who are the private demanders of these factors participate in these collective decisions related to public support for, and adminis-
tration of investments in schools. State law requires now (unlike a century ago) various minimum levels of these services. Regulations specify, among other things, minimum acceptable qualifications of teachers, public school bus transportation for virtually all students at no personal expense, specified minimum curricular offerings, in some cases free textbooks, and access to twelve years of schooling -- at no direct cost.

The economic rationale for collective public support of education is the belief that there are bona fide public as well as individual benefits. But what if large proportions of the educated individuals leave the region for lack of adequately paid employment opportunities at home? In this case, for the locality, the public benefits component of the output of education is reduced. Viewed from a general social perspective, either of two phenomena may reduce the public value of local or regional educational inputs. They are a) a decline in population through general outmigration, or b) a deficient set of opportunities to utilize the enhanced productive contributions for those with higher quality education. In either case, the human capital products of investment in improved educational services do not accrue as economic benefits to the home community. Hence, the optimum community investment is reduced. Under either assumed condition -- even ignoring differences in fiscal capability among regions -- there is no reason to expect equality of local public support for public education across communities of which some are growing and some declining, or those with differing job opportunities for those who acquire higher level economic skills.

The Private Demand for Educational Services

Viewed from a strictly economic theoretical perspective, the demand for human-capital-producing inputs is a derived demand. If informed indi-
viduals (families) act rationally, they invest individually in schooling to a level at which discounted future returns equate to marginal costs, inclusive of foregone earnings. In this calculation, allowances are made in the discount rate for differences in time-preferences with respect to income. Differences in level of personal investment reflect these time preferences, the marginal utility of income, and associated amenities of the opportunity sets with which they are confronted. Differences in the marginal productivity of educational inputs owing to differences in innate capabilities of individuals result in a modified equilibrium level of schooling investment.

Taken together, this means that if educational opportunities are equivalent, differences in levels of personal investment reflect the operation of a perfect market in space, form, and time for this class of investments. Productivity within and outside the region and in futurity is taken into account. In short, differences in the level of investment are explained by three classes of phenomena. These are a) differences in personal costs, b) differences in preferences and c) differences in innate capacity as reflected in the present value of marginal productivities of additional inputs among individuals.

Note here that this theory assumes perfect foresight about economic alternatives at both public and private level. Put differently, it assumes that perceptions of the future productivity of human capital inputs are independent of the immediate geographic social and economic environment in which the individual is reared and makes his educational choices. Moreover, the valuations of his/her alternatives are based on a set of preferences which are independent from his knowledge of alternative outcomes, i.e., they are not "learned" or subject to change. A perfect market is
defined relative to a set of pre-determined preferences reflected in the relevant demand functions, and these preferences are independent from the associated supply functions, totally different entities determining each. The assumptions, it appears, are deeply embedded in the conventional formulation and, as will be shown, critically important.

A REASSESSMENT

Mark Blaug, in his biting methodological critique of conventional welfare economics, makes an eloquent and controversial observation. He says, "Decision-makers do not try to get what they want; they learn to want by appraising what they [appear likely to] get. Means and ends are indissolubly related, and ... technical advice about future decisions searches in vain for a [determinate] social preference function which is not there." (3; p.51. Brackets added.)

Unlike some other production processes, the supply of human capital is obviously determined in very major respects by behavioral elements. And the behavioral elements are determined by "appraising what they get" or seem likely to get, irrespective of the truth of their perceptions. Included are both objective economic outcomes and more subtle social and cultural elements. That these cultural elements may long endure is illustrated by the high value attached to education in the remote Minnesota iron mining area with its heavily Norwegian, Finnish and Swedish population compared with the much older Anglo-Saxon settlement of formerly isolated central Appalachia. Preferences are not given in nature; they are created. But they are no less real on that account, and, as Blaug suggests, they derive potentially from rational appraisal of economic and other outcomes, i.e., personal inquiry which modifies perceptions of
objective realities.

The Public Supply of Educational Services

Before the recent period of industrial development in the study area, migration of educated persons to other areas was a highly predictable event. Coal mining, farming and forestry, all declining industries, had never greatly rewarded educational achievement. Hence, developed social preference systems were carried forward into the post-1970 period in both laity and leadership. These preference systems did not accord high priority to public investments in human capital. Plunkett and Bowman's classic study documents the lower standards of excellence held by indigenous leaders from those reared in external environments where, presumably, the economic value of education if greater.(14)9 This raises the fundamental question of why these preferences have not, in general, been modified with the now two-decade-long infusion of what is usually regarded as a "modernized" sector, manufacturing.

Private Demand for Education

It is, of course, questionable that the deficient private demand for education which is so obviously deficient in this and many similar areas is independent from the local opportunities for use of acquired skills and understandings. Few investments have a payoff period so remote from the period when costs are borne as education. Causal linkages between education and economic opportunity are by no means obvious to the untutored. Moreover, when most of the markets for these skills and understandings is remote in space from the place where the inputs of effort, foregone income and foregone leisure occur, the positive reinforcements for learning from direct visible demonstrations are lost.10 As Hughes (9) notes,"...a major part of their tendencies ... results from
the failure of their limited experiences to provide understanding of the beneficial effects of education, ... upon the economic opportunities of their children.\textsuperscript{10} Some of the literature of educational psychology suggests that perceptions of parents and children are to a large extent conditioned by the immediate social and economic environment of which they are a part. Accordingly, demand for educational services is shifted to the right or left, hypothetically in the same directions as supply. The electronic media and extra-regional experience which inexpensive transportation afford may help; and our institutions for training school teachers have made some progress in devising techniques for developing interest in subject matter and awareness of the importance of learning. But it seems unlikely that educators can go very far toward overcoming the encumbrances of the social and economic environments of the poverty cultures of this and other regions and communities like it.\textsuperscript{11}

The Impact of Industrial Growth

The small industrial revolution in this region has not, it would appear, altered the low demand for educated personnel. Does this mean that the traditional value constellation which people inherited from an earlier period is intractable -- a chronic situation of under-investment in human capital irretrievable except by direct autocratic intervention? On the contrary, the evidence is that the hypothesis is simply untested.

As a matter of practical fact, this "industrial revolution" has changed substantially nothing with regard to the skill composition of the local work force. The proportions of a) managers, administrators, professional, paraprofessional and technical workers and b) production, conversion and materials handling workers in the various product classes of the 1981 manufacturing work force in the Kentucky survey area appear to be almost
imperceptibly different from that of the coal mining industry, the previously dominant basic industry in a majority of these counties. (Table 3). Local examples of people whose occupations and affluence demonstrate that more schooling and greater academic achievement are essential if they, themselves, are to achieve affluence and economic security are as infrequent and inconspicuous to others as when the region was dominated by the coal industry and small farms. To the local inhabitants, the direct, visible evidence of large economic rewards for additional schooling and better school performance is scarce. The islands of reward enjoyed by the educated appear to remain almost as difficult for most local people to discern in the sea of occupations with minimal education requirements as though the industrial boomlet had not occurred.

HYPOTHETICAL POLICY ALTERNATIVES -- A SYNTHESIS

The foregoing analysis suggests that the composition of industries and occupations in the immediate social and economic environment determines, in part, the supply and demand for educational services. It does so through altering the perceptions -- and, hence, evaluations -- attached to human capital investments, public and private. The historically limited demand for educated personnel (and the migration to other areas of the educated local population) left a residual supply of under-developed human resources. Up to this time, the expanded manufacturing industry sector of the region has been predominantly, although not exclusively, one which requires a mix of skills and trainings which is quite similar to that of the traditional economic base, i.e., mainly elementary literacy and willingness to perform routine manual tasks. Thus, politically, socially, and psychologically, the basis for a deficient supply and limited demand for educational services is further reinforced by the limited educated
personnel demands of existing manufacturing industry. Indeed, profitabil-
ity of most of these industries depends on maintaining a large local supply
of low-cost labor, which is inconsistent with upgraded educational qualifi-
cations of the citizenry. Scattered informal case evidence suggests that
it is quite infrequent for company policy to encourage improvements in
educational services or more intensive use of the existing supply. Hypot-
hesized are local labor markets in which the demand for and supply of
educated personnel are, unlike the conventional assumption of neoclassical
time, quite interdependent relationships. (These interdependencies are
schematically illustrated in Figure 2.)

If we assume free mobility of capital and labor to seek its maximum
return employment, wherever that may be, the issue for open economies
becomes clear. How can this condition of pervasive under-investment in
human resources and an environment which reinforces existing deficient
demand and supply of human resource investments be modified?

The present criteria employed in so-called job-creation programs
is simply one of creating jobs at the lowest cost per job to the community.
Either this or a laissez faire policy have the same result -- low-wage,
low-skill-demanding industries which reinforce the under-investment status
quo. But could this be changed? Could the same fund of location incent-
tives, state and local, be used more selectively to recruit industries with
more education-demanding personnel requirements? What are the trade-offs
between numbers of jobs with limited average education requirements and
jobs which require and reward enhanced educational qualifications --
those which provide the social climate which encourages better schools and
more complete utilization of educational opportunities?

Much more rigorous evidence is needed. The evidence on trade-
offs is only anecdotal and obviously of pivotal importance in determining
whether greater selectivity in recruitment and subsidization of employers is a feasible strategem. However, preliminary estimates of probabilities of new locations of various classes of manufacturing have been made for selected communities in Appalachian Virginia, West Virginia and Pennsylvania. The estimates are from the linear probability industrial targeting model developed by Goode and his associates (6). They suggest that in at least a few communities there are fairly favorable trade-offs between traditional low-wage, low-skill demanding industries and those with more demanding requirements. Another hypothesis based on indirect and somewhat anecdotal evidence is that a moderate change in the composition of the employment base would significantly alter personal and community values with respect to education.

If these now-untested hypotheses prove to be generally valid, they would hold out the possibility that the labor under-utilization, human capital under-investment syndrome may yield to a new policy strategy. That strategy would be one concentrating community recruitment efforts and financial incentives on industries which demand greater educational qualifications in their personnel, and which infuse into the community greater amounts of tangible, personal evidence of the economic value of education. Such industries also bring with them people with more highly developed standards of excellence in the quality of education supplied to the citizenry. It is those industries which could create locally -- and hence visibly -- an effective derived demand for educational inputs, as well as a shift in power balances toward one which will provide an enhanced supply.

In summary, the evidence shown in this paper is meant mainly to illustrate the logic of a possibly useful reformulation. It is a reformulation
which casts aside the conventional presupposition that values are independent of facts. If, as Blaug (3) suggests, "Means and ends are indissolubly related," so also is the economic environment which shapes perceptions of means and their consequences a potential element of significance. It may be strategic to long-term development strategy in presently underdeveloped economic regions with underdeveloped human resources. The employment-creation strategy of the community may be centrally important to the solution of the problem of chronically under-utilized labor supplies. In the multi-generation length of run which is important to economic development policy, Say's law may need to be stood on its head, i.e., the demand for developed human resources may need to be viewed as a potential determinant of supply.

The empirical research required will be risky, complex and demand most creative and technically competent work from economics, sociology, and educational psychology. It will also be costly, but surely less costly than the losses in productivity and over $300 per capita annual income supplements that were extended to impoverished people in this one small region.¹³
FOOTNOTES

1. The Economic Research Service studied only nine of these counties including all of those with the heaviest infusions of manufacturing employment. The remaining ten are contiguous to the original nine and also located in Kentucky.

2. These estimates are compiled from Stoll (27, pp. 107-109) and are based on a) 1970 estimates of actual employment and b) labor force participation rates comparable to the average for the United States in populations of similar age, sex, education and race.

3. Based on a randomized sample survey of the employment histories and characteristics of 382 persons age 18-65 (16). Note that the method of estimation was not directly comparable to the Stoll study referenced earlier. Since national norms of labor force participation do not include those who are "discouraged workers" who no longer actively seek employment, the 1970 estimates understate actual labor supplies and under-utilization. This factor aside, it is apparent that growth in total employment of more than one-fourth made, at most, only a small change in utilization. Absolute numbers of unutilized workers may have even increased.

4. An investigative report by Neil Pierce in a September 1987 issue of the Washington, D.C., Post cited in a follow-up article by Kris Fatzone in the Lexington (Kentucky) Herald-Leader (November 30, 1987) pointed out very serious misallocations of funds, among them, failure even to purchase textbooks. The reference was to the survey county with the largest amount of manufacturing employment growth in the region.

5. Still more recent is the presently unpublished work of Dr. Frank Goode of Pennsylvania State University and others who collaborated in a thirteen-state regional research project (6). It carries this line of research to near a logical terminus in a set of econometric models for sixty groupings of manufacturing industry. Linear probability models provide the capability to generate probabilistic predictions of new locations of each individual class of industry for any identified minor civil division or municipality within the 13 state region.

6. Prof. William Miernyk, an important early developer of input-output models, in recent personal conversation correctly pointed out that input/output models were not designed to capture long-term changes of the types discussed in this paper. However, it is evident that they have been uncritically applied without recognition that they have such limitations. So also with economic base models; although simulators could in principle incorporate these long-term dynamic elements, the requisite research information base appears to be wanting.

7. A front-page article in the Lexington (Kentucky) Herald-Leader on June 14, 1988, raises the question of whether the state with its under-schooled labor force can compete for so-called "satellite" component-manufacturing plants to supply the newly-established Toyota automobile assembly plant
located near Lexington. Toyota itself has followed the policy of hiring only personnel with at least secondary school education. It has had a total of more than 80,000 applications for approximately 3,500 jobs.

8. In addition to the externalized direct economic benefits, there are, of course, the contributions of schools to socialization of the young, their understanding of public decision processes on the local, national and international scene, and their ability to appreciate and enjoy literature, the arts, and other public and private amenities.

9. That fact is documented superbly by a rarely referenced, but classic, study by sociologist H. Dudley Plunkett and economist Mary Jean Bowman, *Elites and Change in the Kentucky Mountains* (14). It documents the fact that the standards of excellence held by indigenous leadership are greatly different from those who have been reared in external environments, presumably ones where the economic value of education in local markets is higher. The low historic perceived value of education in the regional economy is embodied in mores which tend to denigrate demands for greater excellence in educational services.

10. This unpublished manuscript is based on studies later incorporated in a University of Chicago doctoral dissertation.

11. Inconclusive but suggestive evidence supporting the general hypothesis is the data for eight independent municipal school districts in the same region. These tend to be larger municipalities and to have a majority of residents who are in the classes of occupations with higher proportions of educated personnel. Financial support was about ten percent higher per pupil, completion rates for entering secondary (grade 9) students was higher by ten percent, and the proportion below national norms by more than one standard deviation on the CTBS total battery of achievement tests was lower (15 percent compared to 23 percent for the entire region and 18 percent for the entire state). (See Table 2, col. 1, and col. 2.)

12. The tertiary sector has grown, of course, especially retail and wholesale trades and services. However, these have always had high proportions of low-paid, low skill operations. Medical, legal, clergy, accounting, and teaching are primary exceptions. However, as Plunkett and Bowman (14) point out, the "home grown" of even these professions do not tend to challenge the low values and standards relating to educational quality and levels of schooling which have been customary.

13. A major research design has been developed and a pilot project is now being reviewed by a funding agency. The design is available on request from the author.
Table 1. Employment Change in 19 South Central Kentucky Counties, 1970 to 1980-84

<table>
<thead>
<tr>
<th></th>
<th>1970</th>
<th>Average 1980-84</th>
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<tbody>
<tr>
<td>Total Employment 3/</td>
<td>37,653</td>
<td>85,312</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>9,716</td>
<td>18,644</td>
</tr>
<tr>
<td>Mining</td>
<td>3,423</td>
<td>9,567</td>
</tr>
</tbody>
</table>


1/Estimated number of employees in counties where data were not disclosed owing to U.S. Government confidentiality rules were based on the midpoint of the range noted. Those estimated account for 10 percent or less of the total.

2/Data supplied by special tabulation from Division of Unemployment Insurance, Cabinet for Human Resources, Commonwealth of Kentucky, Frankfort.

3/Does not include unpaid family workers and others not covered by unemployment insurance, i.e., includes "covered employment" only.
Table 2. Primary and Secondary School Financing and Measures of Performance, School Year 1980-81.

<table>
<thead>
<tr>
<th></th>
<th>(1) Nineteen South Central Counties (All Districts)</th>
<th>(2) Independent Municipal Districts¹/²</th>
<th>(3) All Appalachian Kentucky</th>
<th>(4) All Kentucky</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per Pupil</td>
<td>$1117</td>
<td>$1235</td>
<td>$1162</td>
<td>$1266²/³</td>
</tr>
<tr>
<td>Proportion Entering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 9 Completing</td>
<td>56%</td>
<td>66%</td>
<td>59%</td>
<td>70%</td>
</tr>
<tr>
<td>Grade 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehensive Test of Basic Skills, %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower than U.S. Norms by more than one Standard Deviation³/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 10</td>
<td>24%</td>
<td>15%</td>
<td>20%</td>
<td>18%</td>
</tr>
<tr>
<td>Grade 5</td>
<td>23%</td>
<td>12%</td>
<td>18%</td>
<td>11%</td>
</tr>
</tbody>
</table>

¹/ Only districts included in (1).

²/ Non Appalachian Districts only.

³/ Total Battery including verbal and quantitative skills.
Table 3: Percent Employment in Occupational Classes by Manufacturing and Mining Product Class (SIC), United States Manufacturers and Kentucky Coal Mining

<table>
<thead>
<tr>
<th>SIC</th>
<th>(1) Managers &amp; Admin. (%)</th>
<th>(2) Professional Para-Prof. &amp; Technical (%)</th>
<th>(3) Total 1 &amp; 2</th>
<th>(4) Production Conversion &amp; Mat. Handling</th>
<th>(5) Proportion* All Mfg. Employees in Survey Area (1980-84)($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>4.8</td>
<td>3.6</td>
<td>8.4</td>
<td>73.7</td>
<td>9.64</td>
</tr>
<tr>
<td>22</td>
<td>3.5</td>
<td>2.7</td>
<td>6.2</td>
<td>82.7</td>
<td>5.92</td>
</tr>
<tr>
<td>23</td>
<td>3.1</td>
<td>1.5</td>
<td>4.6</td>
<td>83.7</td>
<td>35.13</td>
</tr>
<tr>
<td>24</td>
<td>4.7</td>
<td>2.1</td>
<td>6.8</td>
<td>72.8</td>
<td>9.09</td>
</tr>
<tr>
<td>25</td>
<td>4.5</td>
<td>2.5</td>
<td>7.0</td>
<td>79.9</td>
<td>2.24</td>
</tr>
<tr>
<td>27</td>
<td>7.1</td>
<td>11.5</td>
<td>18.6</td>
<td>46.8</td>
<td>3.09</td>
</tr>
<tr>
<td>28</td>
<td>8.2</td>
<td>19.2</td>
<td>27.4</td>
<td>51.9</td>
<td>3.00</td>
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<tr>
<td>30</td>
<td>5.7</td>
<td>5.0</td>
<td>10.7</td>
<td>76.9</td>
<td>1.15</td>
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<tr>
<td>32</td>
<td>4.9</td>
<td>4.7</td>
<td>10.6</td>
<td>76.0</td>
<td>4.45</td>
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<tr>
<td>33</td>
<td>4.4</td>
<td>6.5</td>
<td>10.9</td>
<td>76.5</td>
<td>2.27</td>
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<tr>
<td>34</td>
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<td>6.8</td>
<td>12.8</td>
<td>73.8</td>
<td>1.80</td>
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<td>35</td>
<td>7.4</td>
<td>16.8</td>
<td>24.2</td>
<td>56.9</td>
<td>10.19</td>
</tr>
<tr>
<td>36</td>
<td>6.1</td>
<td>19.9</td>
<td>25.0</td>
<td>58.7</td>
<td>2.31</td>
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<tr>
<td>37</td>
<td>5.4</td>
<td>20.2</td>
<td>25.6</td>
<td>51.0</td>
<td>1.12</td>
</tr>
</tbody>
</table>

Estimated Weighted Mean,*** of Manufacturing SIC’s shown above.

12 Kentucky Bituminous & Lig. Coal Mining** 6.4 3.7 10.1 83.8 ----

3. Manufacturing Proportion from Special Tabulation for 1980-84, Kentucky Cabinet for Human Resources, Frankfort, KY.

* Presents the proportions of employees within the manufacturing sector, i.e., 9.64% of the employment in the manufacturing sector is in Food and Kindred Products in the Kentucky Survey Area. Not shown are classes of manufacturing with less than 5 firms, proportions are of average total manufacturing employment and do not total to 100%.
** Not considered in the manufacturing sector.
*** Based on assumed similarity of regional distribution with U.S. distribution of occupational classes. Comparison of survey data with U.S. data for SIC 20, 23, 24 and 35 indicate approximately similar proportions.
Figure 1. Survey Area of University of Kentucky Study
Figure 2. Externalized Effects of Industry Mix on Demand and Supply of Educational Services (Human Capital Formation)
REFERENCE


(13) North Central Regional Center for Rural Development. Proceedings of


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