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FUNDING ADJUSTMENTS FOR EDUCATIONAL OVERBURDEN AND COST DIFFERENTIALS: IMPLICATIONS FOR URBAN DISTRICTS IN ILLINOIS

F. Howard Nelson

University of Illinois at Chicago

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University of Illinois at Chicago

College of Education, Box 4348

Chicago, IL, 60680

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FUNDING ADJUSTMENTS FOR EDUCATIONAL OVERBURDEN AND COST DIFFERENTIALS: IMPLICATIONS FOR URBAN DISTRICTS IN ILLINOIS

School finance reforms aimed at property tax base equalization have not only left the contemporary problems of central cities unresolved, but reform may have exacerbated city conditions according to many researchers (Berke, 1974; Berke and Callahan, 1972; Callahan et al., 1973). Additionally, formulas based partly on tax effort tend to penalize urban districts where education tax effort tends to be low despite high combined municipal and educational tax rates. Reform beneficial to cities needs to take another direction. In Levittown v. Nyquist (1978), the four largest cities in New York successfully argued in the lower courts that the state aid formula failed to recognize four overburdening conditions faced by the state's largest cities---municipal overburden, educational overburden, cost differentials, and absenteeism. The case neatly summarizes the school finance reform agenda for urban centers throughout the country, but could reform directed at these problems leave cities empty handed once again?

The Illinois State Board of Education (ISBE) staff recently recommended that the state funding formula be changed to explicitly account for the disproportionate number of special need students in some districts, and variations in the cost of resources faced by school districts (Illinois Public School Finance Project, 1983). The effort generated national interest and has been greeted with enthusiasm by school finance reformers seeking to shift emphasis from equity to adequacy (For a discussion of adequacy issues see McCarthy, 1981, Carnoy, 1983; Wise, 1983). Following preliminary studies of

the Illinois plan, Chicago Superintendent Ruth Love wrote that, "Although saddled with the rather unwieldily title of, 'The Development of a Resource Cost Model Funding Base for Education in Illinois,' this document may well represent the most cogent, intelligent document about school financing to surface in recent years" (Chicago Tribune, Jan. 17, 1983). Once the Resource Cost Model (RCM) was connected with a specific funding mechanism later in the year, however, school finance reform again appeared to exacerbate the urban situation, and this time in the process of adjusting for variations in educational need and cost differentials. "The proportion of total state and federal resources would be decreased for Chicago and increased for all other district types, most significantly for elementary and the unit districts," (Illinois Public School Finance Project, 1983). This analysis shows how a well-intentioned and highly rational policy intiative, that conceptually recognized the special situations of cities, backfired.

OVERVIEW OF THE RESOURCE COST MODEL

The Resource Cost Model (RCM) originates in the "best practice", "exemplary program," or "reputational survey" approaches to cost estimation. According to Hartman (1981) these methodologies do not allow for the inclusion of future programmatic changes, or for evaluating programmatic tradeoffs. Manipulation of cost records and arbitrary cost allocations distort critical input data. As an alternative, the Resource Cost Model utilizes experts to construct programs as they might exist. The RCM was developed at the Institute for Research on Educational Finance and Governance at Stanford University, funded by the National Institute of Education. The chief consultant employed by the Illinois State Board of Education was also the associate

director of the Institute for Educational Finance and Governance during the study. Kakalik (1977) and Hartman (1981) employed frameworks similar to the RCM to assess the cost of implementing P.L. 94-142. The RCM approach in Illinois improves on these efforts by integrating price indexes into the cost analysis. In addition to the RCM, "judgemental" cost models have been used to estimate the costs of providing bilingual education in Texas (Cardenas et al., 1976), Colorado (Robledo, et al., 1978), and Utah (Guss Zamora, et al., 1979).

The RCM ultimately determines an "appropriate" cost of education for each school district which may be more or less than what the school district actually spends. The appropriate cost is a function of: 1) the quantity of resources (e.g., teachers, supplies, buildings) needed by each district, and 2) the price of resources faced by each district. Thus, cost is the product of price and quantity.

The quantity of resources depends on: 1a) the educational needs of students in the district (e.g., regular education, special education, vocational education, etc.), and 1b) a set of state program specifications or standards on how students should be appropriately served (e.g., minimum and maximum class size, materials costs, etc.). The "cost" of resources faced by a district depends on factors under the district's control, such as higher salaries for experienced teachers, and uncontrollable factors, such as higher salaries to compensate teachers for the higher cost of living in urban areas. The "price" of resources refers only to resource cost differences beyond the control of district decision makers. The RCM calculates prices facing each district as the product of: 2a) the state average price, such as the state average teacher salary, and 2b) a price index that separates the effects of uncon-

trollable costs from controllable costs, and through statistical procedures estimates the magnitude of uncontrollable costs.

THE RESOURCE COST MODEL IN ILLINOIS

In order to determine the appropriate cost of education for each district in Illinois (designated the RCM cost by Associates for Education Finance and Planning (AEFP), consultants to the Illinois State Board of Education), three studies were initiated. First, they created a set of state program specifications through what came to be known as the Program Cost Differential (PCD) study.[1] Second, they obtained program enrollments or an adequate estimate of program enrollments in each school district. Third, they established price indexes for major resource categories (teachers, administrators, noncertified personnel, etc.) through what came to be known as the Cost of Education Index (CEI) study.[2]

PROGRAM COST DIFFERENTIAL (PCD) STUDY

Appropriate resource utilization decisions were made in five expenditure categories: 1) instructional programs, 2) school administration and support services, 3) district administration and support services, 4) energy, and 5) transportation.

Instructional Programs. Committees decided resource needs for eight program categories: elementary, secondary, special, gifted, vocational, compensatory, limited-English-proficient (LEP), and adult education. Members of the committees were chosen for their program experience and/or the constituency they represented. Together, the eight program category committees created 160 instructional programs. For each instructional program, the relevant program

committee determined: 1) target, minimum and maximum class size or caseloads, 2) FTE personnel requirements, 3) purchased services, 4) supplies, 5) special equipment, and 6) building space needs. These determinations reflect "appropriate" resource needs, not "minimal", "basic", or "equitable" resource requirements.[3] Table 1 lists resource requirements for 8 of the 160 instructional programs, one for each program category.

School Administration and Support Services. A committee also established the "appropriate" staffing and resource needs for schools as a function of school size. Based on state average prices in 1981-82, a minimum size elementary school of 200 students costs $538 per student for school administration and support services (Chambers and Parrish, 1982, p. 99). Costs for target size elementary schools of 400 students drops to $424 per pupil, and the maximum size school of 700 students incurs only a $342 cost per pupil.

District Administration and Support Services. Again, enrollment drives resource utilization, and costs decline continuously with size. The committee decided that a district achieves most economies of scale with an enrollment of about 1,000 students and exhausts almost all economies of scale with a 6,500 student enrollment. Taken together, general district administration costs about $263 per pupil for 650 students, based on state average resource costs (Chambers and Parrish, 1982, p. 99). A 6,500 student district costs $148 per pupil for district administration, and for a 19,000 district the figure falls to only $140.

Energy Needs. A computer program, designed by engineers, calculates the fuel and electricity needs based on a protypical building, its usage, and climatic zone. The prototypical building represents current construction prac-

tices in the state, and does not vary among the state's five climatic regions. The actual energy source utilized by the school district (natural gas, fuel oil, coal, liquid propane, or electricity) and actual prices are applied to energy requirements to calculate and energy cost index.[4]

PROGRAM ENROLLMENTS

The incidence and distribution of special need pupils among schools and grades determine how students are served in the 160 instructional program. AEFP explicitly noted that the data sources for program enrollments varied considerably in quality among the program categories and hoped that once implemented the RCM would be based on accurate data collected according to uniform guidelines. The major problems, they believed, came from the lack of sufficient detail to slot students into the hypothetical "appropriate programs" especially in regular elementary and secondary instructional programs. The label "12th graders" for example, does not indicate whether the students are in an advanced algebra or a remedial instructional course. As a consequence, the distribution of students among regular elementary and high school's instructional programs, such as advanced algebra or remedial instruction, is identical for each school in the state. Thus, variation in need among districts comes only from enrollment variation in programs for "special needs" pupils.

Relatively good state data for special education describe every student in the state according to: 1) the handicap of the pupil, 2) the nature of the program setting. 3) the severity of the child's condition, 4) the age of the child, and 5) the number of schools likely to be served by each staff person. Data files list related services (e.g., adaptive therapy, psychiatric help,

physical therapy, etc.) received by each student. A computer algorithm allocates each student to the appropriate instructional program(s) and/or related service. The state collects equally detailed data in vocational education. A computer algorithm allocates students to the hypothetical "appropriate" program on the basis of courses in which students are actually enrolled. On the other hand, all districts received credit in the initial simulation for 5 percent of the district enrollment, the state maximum for gifted education. Only students actually served in gifted programs will provide the data base in future simulations.

Students enrolled in federal Chapter I and II programs provide the basis for compensatory education enrollments. This figure differs from the count of "Title I eligible" students that currently provides the basis of an index intended primarily to allocate more general aid to the state's largest school districts. Districts with 27 percent or more Title I eligible students, for example, count these students as 1.625 students in the general aid formula. The funds generated by the weighting are not specifically used for compensatory education instructional program. In Chicago over half of the students are designated as Title I eligible but only about 15 percent were counted as receiving services in the 1981-82 Chapter I evaluation reports.

The initial simulation counted only those pupils in schools with 20 or more limited-English-proficient students, thus excluding many schools with small, state funded bilingual programs.

THE COST OF EDUCATION INDEX (CEI)

The theoretical model on which the personnel indexes of the Illinois CEI were constructed, the hedonic wage theory (Rosen, 1974; Lucas, 1974; Brown,

1980) views salary determination as the outcome of a bargaining situation between individuals and schools districts. According to the theory, districts recruit individuals for specific job assignments, and individuals seek remuneration according to their perceptions of working conditions, the cost-of-living, environmental factors such as pollution, traffic congestion and crime, access to medical facilities, and other factors. Therefore, the price of personnel is determined by studying individual reactions to the work situation rather than using school districts as the unit of analysis. Surveys of about 1800 teachers, 800 district support personnel, 700 school administrators, 900 district administrators, and 1250 non-certified personnel provided the data for the price indexes. Other empirical studies based on the hedonic wage theory include Antos and Rosen (1975), Chambers (1978, 1980), Kenny, Denslow, and Goffman (1975), and Wendling (1981).

Calculation of a price index begins with a statistical analysis of the various factors determining salaries. The multiple regression analysis yields a coefficient for each variable denoting the direction and size of the effect. Next, "controllable" variables are distinguished from "uncontrollable" variables. Sometimes, the distinction may simply be drawn between those variables policy makers want in the index and those that they do not want. Specifically, the Illinois price index for teachers designates the following types of variables as either controllable or inappropriate for inclusion in the index:

- teacher age, sex, race, education, experience, and job assignments.
- planned early retirement.
- job mobility limited by spouse.

- class size.
- district type (elementary, unit, high school).
- percent teachers in county covered by bargaining agreements.

Designated as uncontrollable variables that should be included in the index are:

- price of agricultural land in county.
- population of the nearest central city.
- distance to nearest central city.
- number of districts per square miles in county.

Except for distance to central city, all of the variables in the index represent regional characteristics. Together, the uncontrollable variables are intended to measure the effects of labor market competitiveness, cost of living, access to urban areas, disamenities associated with congestion and size, and access to consumption opportunities. Noticeably absent from the list of uncontrollable variables used in the index are those related to the specific working conditions of the school districts, such as the poverty background and academic preparation of pupils, the quality of support services and facilities, and safety of the work place.

A summary of the estimated statistical relationship between the designated uncontrollable variables and salaries in the five personnel categories are outlined in Table 2. Higher priced agricultural land contributes to all indexes. Districts near to, and far from, central cities confront higher prices for all personnel categories. Districts per square mile in the county contributes to higher prices for teachers and non-certified personnel. Districts in urban areas with medium-sized central cities face the highest

prices for teachers, instructional support personnel and non-certified personnel, but the least for school and district administration. Though AEFP claim that their findings are consistent with theoretical expectations, the slope of the relationship between central city size salaries for teachers, instructional support personnel, and non-certified personnel appears to be contrary to theoretical expectations, and is inconsistent with the findings for school and district administrators.

The price index is calculated by substituting state average values for the controllable variables in the salary equation, and using the actual district values for uncontrollable variables. The ratio of the statistically predicted salary to the state average salary is the index. Table 3 presents the indexes for Chicago, the 10 metropolitan areas in Illinois, and nonmetro districts. Clearly, resource prices in urban areas exceed those in rural Illinois. The price of teachers in the Chicago metro area exceeds nonmetro districts by 13 percent, and the price of district administrators and non-certified personnel are 24 percent higher. Only a slight difference exists between the teacher cost index in Chicago and the remainder of the metro area, however. Similarly, the cost index for other urban districts in the state varies only marginally from nonmetro districts.

THE APPROPRIATE COST OF EDUCATION (RCM COST) FOR EACH DISTRICT

The hypothetical "appropriate cost" of education for each district, oftentimes referred to as the RCM cost in Illinois, is calculated by: 1) combining state program specifications with enrollments to determine the resource needs unique to each district, and 2) multiplying the quantities of resources by the appropriate prices determined from the resource price index.

District A, for example, might have a teacher cost index of 1.05 and 16 LEP pupils of the same language in an elementary school. With this number of LEP pupils, the appropriate program specification from the PCD study calls for instructional program 706--bilingual pullout K-8 (Table 1, row 7). With 16 pupils, one teacher is needed, which at the state average salary costs $1,072 per pupil. The RCM cost, however, is 5 percent higher according to the teacher price index or $1,125. District B, on the other hand, might have 24 LEP pupils of the same language in the school, though otherwise identical to District A. According to instructional program 706 (Table 1, row 7), two classes of 12 students yield costs of $1,429 per pupil at state average prices, or an RCM cost of $1,500 per pupil after applying the teacher price index.

Table 4 lists the total RCM costs summed over all instructional programs for several districts in Cook County. The RCM costs are sometimes lower and sometimes higher than actual expenditures. The initial simulations showed that total RCM costs in the state of 5.3 billion practically matched the actual costs of 5.1 billion, indicating that spending by some districts in excess of RCM costs about equalled the shortfall of spending by other districts compared to the RCM estimates (Chambers and Parrish, p. 9).

THE RCM AS A BASIS FOR A NEW GENERAL AID FORMULA

The RCM could be a valuable tool for state-level planning and budgeting. Projection of resource costs and needs for various combinations of educational programs, instructional strategies, services, and staffing configurations could easily be accomplished. In this sense, the RCM resembles the data-driven econometric models used in planning state and federal economic strat-

egies. The intended use of the RCM in Illinois, however, is direct use in allocating state aid.

Though the RCM costs can play a role in any type of funding formula, the ISBE staff recommended that the RCM costs serve as the foundation level in a foundation formula.[5] Categorical funding of special programs by the state would be eliminated. Each district in the state would have a unique foundation level equal to the RCM costs minus the costs calculated for compensatory education.[6] According to Table 4, for example, Chicago's foundation level would be about $2.775 per pupil, while Bellwood's would be $3,014 per pupil. The state would require districts to levy a minimum property tax rate, probably well in excess of the current minimum tax rates, and the difference between property tax levies raised by this tax and total RCM costs would be covered by state funds and federal funds excluding federal funds designated for compensatory education. If both Chicago and Bellwood raised $1,500 per pupil with the required tax rate (in fact, they do not), state aid would be $1,275 per pupil in Chicago and $1,514 in Bellwood.

Based on simulations using data from 1981-82 that assume: 1) no change from the present law in required tax rates, 2) that all categorical funding becomes part of general aid, 3) no flat grants, and 4) no hold harmless provisions for districts that lose aid, the following outcomes result (Illinois School Finance Project, 1983):

- State revenues would need to increase $1.2 billion (compared to about $2 billion appropriated for education in 1981-1982).
- The proportion of total state and federal resources designated for Chicago would fall from the actual 31 percent in 1981-82 to 26

percent, but would increase for other district types, especially elementary and unit districts.

A CRITICAL APPRAISAL OF THE RCM METHODOLOGY AND THE FUNDING OF URBAN SCHOOLS

The results of the funding formula simulation based on the RCM cost determination indicated that Chicago loses substantial state aid relative to other districts. Appropriate costs for Chicago in 1981-82 were calculated as $2,754 per pupil, well below actual 1980-81 costs of $3,115 (row 1, col. 3, Table 4). Similarly, the actual 1981-82 costs exceed RCM costs in all of the central cities in the state's other nine metro areas. Though the RCM accounts for many pupil needs and price differentials, Chicago fails to recapture state resources currently funneled through an urban aid factor, and state categorical aids. Perhaps more disturbing, however, is the oftentimes favorable treatment of suburbs.

Possible explanations of the poor outcome for Chicago include the following: 1) urban education programs in Illinois are more than appropriate, 2) huge amounts of waste and inefficiency exist, and 3) systematic bias in the RCM. The first explanation certainly fails though this is exactly the implication of the RCM cost estimates. The second, though partly true, comes no where near explaining the gap between "appropriate costs" calculated by the RCM and the actual Chicago educational experiences. This section comments on the conceptual and technical problems with the RCM's treatment of large cities. While some of the criticism applies specifically to Illinois, emphasis is placed on problems with the general approach.

ENROLLMENT DATA FOR SPECIAL NEEDS PUPILS

Based more on intuition than good data, some researchers (e.g., Guthrie, Garms and Pierce, 1978) have recommended added state attention to financing special education as a means of assisting cities. Visual inspection of Table 4 indicates that the proportion of enrollment served in special education determines much of the RCM cost variation within Cook county, and that Chicago serves only 10 percent of its students in special education. AEFP noted the poor quality of enrollment data, but poor data fails to explain the bias against Chicago. In fact, the quality of special and vocational education data exceeded those in other instructional categories.

Intuition tells us that poverty, poor health, poor housing, and poor pre- and postnatal care in large urban areas should put the incidence of special education in Chicago as highest in the state, not at the bottom. New York City, for example, has one-third of the state's pupils, but one-half of its special education pupils (Goertz, 1981, p. 118). Part of the reason for the high incidence of special education pupils, however, comes from the extra weight such pupils receive in the New York general aid formula (each pupil counts double), and a definition of "handicapped" based on low test scores. Only one of about 125 elementary and unit districts in Cook county had a smaller proportion of handicapped pupils than Chicago. Special education enrollment in Illinois urban areas vary. Among other metro districts in the state, Champaign, Urbana, Peoria, and Waukegan serve about 16 percent of the school enrollment in special education while Decatur, Elgin and East St. Louis serve about 11 percent.

Actual enrollments in special education may differ from "appropriate" enrollments because: 1) the same procedural requirements in different districts yield varying results (Weatherley and Lipsky, 1977), 2) Fiscal resources available to districts partly determine the scope of programs, and program enrollments often determines need (Nelson, 1982a, 1983), and 3) State and federal funding mechanisms create incentives and disincentives for local decision makers that operate partly through program enrollment decisions (Hartman, 1980). Foremost among the problems faced by Chicago is probably the absence of resources. In recent econometric analyses, Nelson (1982a, 1983) found that fiscally strong districts served more students as handicapped, particularly in the mildly handicapped categories. Chicago faced the last decade's mandate for special education with a budget that accumulated deficits over the 1970s, went bankrupt in 1980, and since then has confronted a declining inflation-adjusted budget (Nelson, 1982b, Chicago Panel on Public School Finances, 1982). Furthermore, many less expensive and/or more highly subsidized alternatives exist for the mildly handicapped such as compensatory education and bilingual education. Currently, the state funds approximately 60 percent of bilingual program costs, for example, but in special education allocates only $6,250 per teacher. Another complicating factor arising in urban situations comes from educational problems so profound that distinguishing the mildly handicapped from the nonhandicapped often proves impossible. Finally, parents of children in urban schools often show less sophistication in utilizing the due process requirements of the law to secure appropriate educational treatment for their children.

The impact of special education enrollment on the RCM cost estimates comes from its expense relative to other special needs programs. Self-contained elementary programs with a target size enrollment cost about $1,100 per pupil at state average prices (Chambers and Parrish, p. 94). The least expensive special educational instructional programs, resource rooms for the behaviorial disabilities and learning disabilities categories cost about $1,400 for target size enrollments. At target enrollments, self-contained classrooms for the mildly handicapped range in cost from $2,500 to $3,500 per pupil. Supplementary services, higher administration costs, and smaller than target class or case load size, lifts costs further. Compensatory education, on the other hand, basically functions as an add-on to regular instruction and for most instructional program configurations constructured through the RCM process costs $100 to $400 extra per student. To the extent that bilingual teachers replace regular teachers, bilingual education costs are minimal, and in any event, substantially less than for special education.

Another bias systematically working against urban areas in the RCM arises from the absence of "appropriate" enrollment information for the remedial instruction program and the compensatory education program category. Children in urban schools undoubtedly have a greater need for remedial instruction whether or not they are currently provided the instruction. In any event, the state does not yet collect such data. Consequently, the RCM arbitrarily allocates 7.5 percent of elementary students, or one percent of high school students, to remedial instruction regardless of school or district characteristics.

Chicago reports that 14.98 percent of its students specifically receive Federal Chapter I and II support for compensatory education, even though approximately one-half of the student body is eligible for Title I services. The urban aid factor in the current general aid formula is based on the latter figure. Fully 100 of the 700 districts outside of the Chicago metro area claim a higher percentage of students actually receiving compensatory education than Chicago. On the other hand, only 12 of the 300 Chicago metro area districts report higher percentages, and only one central city in other Illinois metro areas reported a higher percentage.

Part of the problem arises from the stipulation in the Illinois RCM process that most students must actually be served to be counted as enrolled. In compensatory education, however, student names often cannot be attached to federal programs. Frequently, entire schools in Chicago engage in compensatory education, much of it without federal support. Perhaps, rather than associating compensatory education with federally funded programs, more emphasis should be placed on collecting good data and constructing more precise instructional program configurations for remedial education within the regular elementary and high school curriculums.

COSTS IMPOSED BY URBAN POVERTY.

The ISBE recognized the problems of funding districts heavily impacted by poverty, perhaps because Chicago fared so poorly in the initial simulations. But they view poverty primarily as a cause of special instructional needs, and secondarily frame poverty as a direct determinant of such noninstructional costs as vandalism, increased security, student transiency, nonpayment of fees, etc. (Illinois School Finance Project, 1983). The RCM considers the

instructional issues related to poverty in the compensatory education instructional program, but as already noted, the state wishes to view these needs as federal obligations and consequently excludes these costs in the RCM calculations for state aid purposes. Imprecise enrollment data raises questions about how much urban areas would benefit from the consideration of compensatory education in the RCM-driven formula. Furthermore, the extent of an "adequate" compensatory education is unknown given the absence of standards on how much parity disadvantage youngsters should acquire relative to their middle class counterparts. Noninstructional costs failed to enter the RCM cost calculations through the cost of selected support systems (e.g., security, health, etc.) may enter calculations in the future. The most serious omission, however, arises from the failure to consider the effect of poverty on the price of personnel.

Recall that the theory behind the Illinois CEI views salary determination as the outcome of a bargaining situation in which school districts recruit individuals for specific job assignments, and individuals seek remuneration based on working conditions and characteristics of the community and region in which they live. As constructed, however, the CEI approximates county cost-of-living differences more so than measuring personnel prices based on the hedonic wage theory.

Only three or four variables determine the personal price indexes. Three variables reflect county or regional characteristics: price per acre of agricultural land in the county, population of the nearest central city, and districts per square mile in the county. Only one variable, distance to the nearest central city, determines the unique index within each county. Index

differences among Cook County's 140 districts, for example, depend only on their proximity to Chicago, with those bordering the city having the highest index. Unsurprisingly, very little variation in indexes exists within counties. The teacher cost index in Cook county ranges from 1.0344 to 1.0619. The dispersion of the indexes in Chicago's collar counties is even smaller. Kane county indexes range from .9565 to .9622, Lake County from .9939 to 1.0141, and Will county from .9492 to .9705.

As a consequence of constructing the personnel indices in this way, districts in remarkably different bargaining positions, with respect to prospective employees, have almost the same indexes. As shown in Table 5, the professional suburbs of Oak Park, Evanston, and Lincolnwood have almost the identical personnel price indexes as the working class suburbs of Berwyn and Cicero. These suburbs, all of which border Chicago, have almost the same teacher indexes as Chicago. Oak Park, Evanston, Lincolnwood and other privileged suburbs in Cook county offer employees quality working conditions (such as small classes, superior facilities, and academically talented students) and a safe, clean community to work in. Chicago, on the other hand, must frequently compensate employees for large class sizes, academically unprepared students, deteriorating facilities, violence against teachers, and unsafe neighborhoods in which to work. According to the Safe School Study (Rubel, 1978), for example, 2.8 percent of large-city secondary school teachers report being attacked in one month compared to 0.7 percent in small cities, .4 percent of suburbs, and .02 percent in rural secondary schools. In urban areas, teachers have one chance in fifty-five of being attacked, but only one in five-hundred chance in rural schools. Clearly Chicago enters the regional labor market for

teachers with substantial disadvantages severely unestimated by the Illinois price indexes. The old National Defense Student Loan program recognized the unique problems faced by inner city schools in obtaining personnel by forgiving loans over a five-year period for teachers in inner city schools. Houston offers a $2,000 bonus for teachers in schools with a high proportion of educationally disadvantaged students, far more than the stipends offered to teachers in short supply specializations (Miller and Say, 1982).

Other urban school districts in Illinois confront the same disadvantage when job characteristics are omitted from the analysis. Independent cities with an industrial, working class character, such as Elgin, Waukegan, and Joliet, have indexes typical of other districts in the counties of Kane, Lake, and Will. The average district in elite, suburban Du Page county, known for restrictive zoning codes and public housing discrimination, has a teacher cost index exceeding the average Cook county district.

Cost index studies for other states, based on the hedonic wage theory, indicate that some central cities incur substantially higher costs compared to the state average. The total education cost index of New York City has been calculated at 1.13 (Wendling, 1981). The index, however, exceeds Great Neck's (1.10) only slightly, falls below White Plain's (1.15), and is less than the New York-Putnam-Rockland-Westchester regional index (1.19). St. Louis and Kansas City not only have higher indexes, 1.15 and 1.13 respectively, but they also substantially exceed the metro indexes of 1.09 and 1.07 (Chambers, 1978). Unlike the Illinois equation, student characteristics enter the Missouri model—percent black pupils and percent pupils in remedial reading both of which contribute to a larger index. California's four largest cities have

indexes about 10 percent greater than the state average—about the same as Chicago's index (Chambers, 1980).

Some of the problems in establishing accurate price indexes for urban areas could be resolved by including the appropriate variables in the estimating equations, such as the poverty background of students, student achievement level, teacher assault data by school, neighborhood crime statistics, quality of facilities, and other variables. But comparable data among school districts is largely unavailable. Furthermore, from a policy perspective, such variables may have an undesirable "image" in an educational funding formula and recognition of these factors might be seen as rewarding and encouraging violence and failure.

METHODOLOGICAL CONCERNS WITH THE CEI

Even though the results of the Illinois CEI are "largely consistent with similar studies conducted in other states," (Chambers and Parrish, p. 66) some technical problems emerge in the regression analysis. As already noted, districts in urban areas with medium-sized central cities face the highest prices for teachers and non-certified personnel, contrary to theory, but the lowest prices for school and district administrators (Table 2). While this example may represent one isolated inconsistency, it may also play an important role in distributing millions of dollars incorrectly.

Other cost of education index studies confronted similar problems. Wendling's New York study (1981) included student characteristics in the salary equations, but with inconsistent effects that sometimes went in the wrong direction. Special needs pupils did contribute to higher teacher costs, but contrary to theoretical expectations, low attendance rates and low student

test scores contributed to lower salaries. In the administrator's salary equation, low student test scores led to higher salaries as expected, but high attendance rates and few special needs pupils also contributed to higher salaries.

In addition to variables with the wrong sign, some variables may be incorrectly included in the Illinois equations. The county-wide price of agricultural land in the Illinois CEI, for example, theoretically represents the base price of land in urban areas and thus higher-cost housing for employees, an important component of the cost of living. Without a variable to hold the quality and potential use of land constant, however, the price of agricultural land partly measures wealth. Consequently, the state could be subsidizing wealth through the price index. The problem exists in urban areas as well. School districts in DuPage county, for example, differ from Cook county districts on 3 of 4 variables in the teacher price index. Distance to the central city and districts per square mile in the county contribute to a lower index, but the variable for the price of agricultural land in the county raises the indexes to levels meeting or exceeding most districts in Cook County. The other three collar counties in the Chicago metro areas, though equally proximate to Chicago, have lower indexes mostly because of the lower price of agricultural land. Clearly, the price of agricultural land does not measure the cost of land very well, nor does it approximate higher living costs.

The intercounty comparison raises another set of specification issues. The independent cities of Elgin, Waukegan, Joliet, and Aurora are assigned to the Chicago metro area and have personnel indexes equivalent to other dis-

tricts in their respective counties. Consequently, suburban Elmhurst in Du Page county has a teacher cost index 11 percent higher than urban Elgin and 10 percent higher than Joliet (Table 5). Either these independent cities should be given central city status, or all variables should be measured on a metropolitan basis rather than on a county basis. The latter approach is probably most consistent with the hedonic wage theory since county lines arbitrarily divide the metro labor market. Furthermore, some districts in Cook county are more distant from Chicage than any district in DuPage county and many districts in other counties. Variation in indexes among school districts according to the variables now in the index would then depend on only one variable for districts in the Chicago metro area--distance to the central city.

CONSTRUCTION, MAINTENANCE, AND ENERGY COSTS

Urban school districts pay more for land, more for buildings, and more to maintain buildings and facilities. The average cost of land per acre in 14 city school districts surveyed by the Research Conuncil of the Great Cities (1964) was 23 times qreater than non-urban districts in the same states. School construction costs exceed those of suburbs becasue of more restrictive building codes and higher union wage scales (Levin, Muller and Sandoval, 1973), and facility costs tend to vary among school districts more than operating costs (Wilkerson, 1981). The absence of new construction in most central cities, including Chicago, mitigates many of these problems. Maintenance costs, however, exceed state averages (Fox and Hurd, 1971) and high construction costs probably slow down replacement of outdated, inefficient facilities. About 150,or 27 percent,of Chicago schools were built prior to 1907. Few other districts in the state boast of facilities built before that date.

Excluding capital costs and maintenance from the RCM process, ignores important cost pressures faced by Chicago that have an indirect impact on instructional spending.[7] Furthermore, energy use assumptions come from a "prototypical" building based on current construction standards. While the state clearly has a interest in not subsidizing inefficient buildings, old schools in Chicago will not likely be replaced soon, yet certainly these expenses draw resources from programs aimed at pupils.

CONCLUSION

The apparent irony of a large central city losing substantial amounts of state aid under a funding formula specifically designed to account for the expense of special needs pupils and costs variations among districts can be analysed in another way. The proposed shift in the basis for funding demonstrates the ascendancy of general state over special-interest funding in an era of declining resources. Under the RCM-driven funding formula, Chicago fails to make up for the loss of state categorical aids and gives up resources funneled through the urban aid factor.

When money is tight, categorical programs suffer at the expense of general aid according to Fuhrman (1982). Legislator's basic ongoing commitment, Wolf (1981) concludes, is to preserve the unrestricted basic aid to which the district back home gives priority. Contentious in-fighting among teachers, school boards, and special interest groups, asserts Fuhrman, has led many legislators to distrust all single interest groups and discount any demand as self-interested. According to Elmore and McLaughlin (1981), single interest groups may well have to communicate with other education interests to form integrated packages, rather than present their claims directly to individual legislators.

These characterizations of state education politics in the 1980s fit well in Illinois. State support for schools declined over the past decade from 48 percent of total expenditures to 38 percent. Declining federal resources increased the local burden another 3 or 4 percentage points, while funding for categorical programs maintained a favorable status in the early 1980s. In 1980, the Illinois State Board of Education chose an Illinois school district superintendent as the new state superintendent, instead of an outsider or a professional within the agency. The new superintendent undertook two major studies reflecting the newly gained influence of local districts. The mandates study reappraised all state mandates. The school finance study, as revealed in the study design and confirmed by the final recommendations, sought to bring all special interest programs and regular education under a general aid formula that considers the unique special needs of each district. Both efforts represent a packaging of special interests, described by Elmore and McLaughlin, that may well succeed in the state legislature better than the direct appeal of special interest groups.

Within the basic RCM framework, several changes could benefit urban areas. First, enrollment ceilings in special education, particularly in the learning disabilities category, would partly alleviate the favorable treatment of suburbs. Second, the costs of poverty could be judged better by: 1) obtaining data on actual enrollments in remedial instruction, 2) directly calculating noninstructional costs of schools and districts as a function of the poverty concentration of the student body, and 3) considering costs imposed by school district characteristics, as well as student characteristics, such as desegregation, and 4) accounting for student body characteristics and work

place conditions in the CEI. Third, methodological problems with the CEI that appear to be systematically biased against urban distict could be worked out. Such changes, however, may not guarantee that cities would not surrender state resources under an RCM-driven funding formula. Advocates for city school children may want to insist on including an urban aid factor to account for "intangible" factors contributing to higher city school costs. For example, the pervasiveness of students from improverished backgrounds in urban schools affects the learning environment for all students.[8]

Yet another perspective, certainly the most pragmatic one, would argue that the funding formula means less to central cities than the informal rules of the legislative process. In Illinois, for example, legislators generally agree that Chicago should receive no more than one-third of state appropriations for education. Lobbyists for the school board measure their success by how close Chicago's allocation comes to this mark. The legislature often adjusts the urban aid factor to meet the one-third objective rather than for philosophical or cost-based reasons. Similarly, an RCM-driven funding formula probably could be adjusted to achieve the one-third objective.

Other central cities may fare better under an RCM funding approach. Chicago receives substantial state funding through an urban aid factor, and cities currently treated less generously may experience improved fortunes through an RCM-driven funding mechanism. Furthermore, the RCM process itself, tends to unify special interest groups more than a categorical program and funding approach. At least during an era of declining power for special interest groups including city school systems, a unified approach to educational funding may have not immediately apparent benefits..

NOTES

1. This process should be called the Program Specification or Program Configuration study because decisions are made about appropriate class size, staffing, and materials. Enrollment information and the price indexes are needed to obtain costs faced by each district. The PCD designation is leftover from the original study design.

2. Like the PCD study, CEI is a misnomer because only the "uncontrollable" costs of personnel are indexed. Educational Price Index might be a more appropriate designation, especially since cost variations, within the RCM rubric, are also a function student needs. Consultants hired by the Illinois Public School Finance Project to review the CEI preferred the designation, "relative price index."

3. Each committee was asked to keep a balance between the resources they would like for each program and what they believed to be affordable. Preliminary estimates of total education costs in Illinois based on these "appropriate program specifications" for 1981-82 enrollments was 5.3 billion (AEFP, p. 9). Since this figure exceeds 1981-82 actual costs by only 2%, "appropriate" effectively means average.

4. Both the energy and transporation studies were part of the CEI study but conceptually they also belong in the PCD study. Basing resource estimates on a prototypical building, for example, is much the same as establishing appropriate program configurations. The prototypical building is described in Appendix G of Chambers and Parrish (1982, p. 220).

5. The foundation formula is: $S_i = F - (r \times V_i)$ where S_i is the state aid contribution per pupil in district. F is the foundation amount per

pupil, r is the required tax rate and V_i is the local property value per pupil in district i. The current Illinois aid formula functions as a foundation plan with F = 1,658 per pupil in 1982-83. Under the proposed changes, F is replaced by F_i, the foundation level unique to each district and F_i equals the RCM cost of district i. The application of the RCM to various other aid formulas is detailed in Chambers and Parrish (1982, pp. 110-113).

6. Compensatory education is considered a federal responsibility, and consequently the state does not want the obligation to fund these programs as federal funding declines. This approach indicates that compensatory education is not viewed as a component of "appropriate" educational costs and possiblly reveals a bias against urban education. The approach may also reflect the lack of knowledge about what constitutes adequate compensatory education.

7. Currently Chicago obtains relatively favorable treatment in the legislature process. Chicago, with one quarter of the state's students gets $25 million, half of the state appropriation for construction and rennovation (Bradshaw et al. 1981). The total appropriation is .4 percent of state aid and Chicago's total budget is about 1.5 billion.

8. G. Alan Hickrod, Ben C. Hubbard, and Ramesh B. Chaudhari suggested this perspective.

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TABLE 1

Examples of Instructional Program Configurations

Program Category (Instructional Program)	Prog. Units	Class Size or Caseload			FTE Pers Per Unit			Expend Per Unit			Bldg. Space
		Targ.	Max.	Min.	Tchrs	Aides	Other Profs	Purch Svs.	Supp/ Mtrls	Spec Equip	Sq. F.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Regular Elementary (Self-contained)	1.0	22	28	12	1.0	0	0	0	1500	1055	900
2. Regular Secondary (English Regular)	1.0	25	30	16	.2	0	0	0	50	235	125
3. Special Education (Speech/Language)	.01	62	62	62	1	0	0	2500	1000	825	500
4. Gifted Education (Resource Center K-12)	.25	100	100	100	1	0	0	500	975	2295	1800
5. Vocational Education (Industrial-Drafting)	1.0	21	26	16	2	0	0	40	80	500	498
6. Compensatory Education (Resource Center)	1.0	50	60	40	1	0	0	0	1000	545	1000
7. Limited English Proficient (Bilingual Pull-out K-8)	1.0	16	23	8	.5	.5	0	100	800	343	450
8. Adult Education (Dept. Secondary, Gr. 10-11)	1.0	18	20	14	.2	0	0	0	80	45	150

Source: Chambers and Parrish (1982; p. 7)

TABLE 2

Contribution of Uncontrollable Variables to Salaries

	Teachers	Instructional Support Personnel	School Administration	District Administration	Non-Certified Personnel
	(1)	(2)	(3)	(4)	(5)
1. Price per acre of agricultural land in county	pos.[a]	pos.	b	pos.	b
2. Population, nearest central city	upside-down U[c]	upside-down U	U-shaped[d]	U-shaped	upside-down U
3. Distance to nearest central city	U-shaped	U-shaped	U-shaped	U-shaped	U-shaped
4. Districts per square mile in county	pos.	b	b	b	pos.
5. Total enrollment	b	b	b	upside-down U	b

Source: Derived by author from Chambers and Parrish (1982; Appendix F)

[a]All outcomes designated pos. (positive) contribute to higher prices, but at a declining rate.

[b]Not included by AEFP for statistical reasons.

[c]The effect is least important for districts near the smallest and largest central cities.

[d]The effect is most important for districts near and far away from central cities.

TABLE 3

Resource Price Indexes and Transportation Cost Index

	Number Of Dist.	Teachers	Inst. Support Pers.	School Admin.	Dist. Admin.	Non-Cert. Pers.	Energy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. All districts	1009	1.000	1.000	1.000	1.000	1.000	1.000
2. Bloomington-Normal	13	.907	.903	.952	.934	.863	.927
3. Champaign-Urbana	17	.922	.911	.957	.942	.906	.833
4. Chicago metro	299	1.045	1.044	1.043	1.082	1.069	1.031
5. City of Chicago	1	1.078	1.080	1.064	1.170	1.174	1.080
6. Moline	19	.935	.935	.932	.908	.921	.924
7. Decatur	8	.947	.957	.948	.977	.967	.977
8. Kankakee	14	.903	.880	.965	.929	.867	.962
9. Peoria	48	.960	.956	.938	.901	.988	.926
10. Rockford	13	.950	.959	.940	.972	.978	1.120
11. St. Louis	57	.973	.989	.948	.917	1.006	.950
12. Springfield	15	.944	.954	.945	.937	.956	.895
13. All non-metro districts	506	.917	.915	.926	.827	.832	.953

Source: Chambers and Parrish (1982; pp. 68-70)

Table 4

RCM Costs and Enrollment by Instructional Program, 1981-82

	Enroll-ment	RCM Cost	Actual Exp.[a]	Wealth Per Pupil[b]	Teacher Cost Index	Reg. Elem.	Reg. Sec.	Spec. Ed.	Gift Ed.	Voc. Ed.	Comp. Ed.	Lim. Eng. Prof.	Adult Ed.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. Chicago	453,330	$2,775	3,115	$41,275	1.078	57.4	29.7	9.9	5.0	21.3	14.9	7.7[c]	0.8
2. Bellwood	2,754	3,014	2,547	59,962	1.054	90.4	0	25.5	4.9	0	4.5	4.3[c]	0
3. Berwyn North	1,278	3,388	2,336	48,657	1.060	95.2	0	27.4	4.9	0	3.1	4.3	0
4. Cicero	5,275	2,634	2,141	62,721	1.062	93.4	0	14.6	4.9	0	3.4	5.4	0
5. Elmwood Park	2,533	2,875	2,786	52,809	1.058	59.7	37.8	17.7	4.9	24.7	5.1	6.3	7.7
6. Evanston	6,808	2,828	3,346	57,947	1.055	94.7	0	21.6	7.4	0	3.4	3.4[c]	0
7. Hillside	384	2,882	3,801	141,373	1.050	94.5	0	21.1	4.9	0	0	1.8	0
8. Oak Park	4,933	2,517	2,571	41,330	1.060	96.0	0	16.2	4.9	0	2.9	1.9	0
9. Pennoyer	240	3,410	2,223	74,172	1.055	98.0	0	26.2	5.0	0	16.6	9.6	0
10. Riverside	965	2,752	3,065	79,910	1.057	97.7	0	17.2	4.9	0	0	.1	0
11. Skokie (#735)	773	2,892	3,870	92,796	1.058	96.3	0	25.5	4.9	0	2.1	11.3	0
12. Union Ridge	370	3,694	3,004	79,188	1.058	90.5	0	31.3	4.9	0	0	11.9	0
13. Wilmette	2,832	2,527	3,057	54,049	1.055	94.1	0	15.5	5.0	0	1.0	1.0[c]	0

Source: Chambers and Parrish (1983; Appendix I and Appendix L); Illinois Public Schools Financial Statistics 1980-81 School Year; Illinois Annual State And Claim Statistics 1978-79.

[a] 1980-81 Operating expenditure per ADA; RCM costs based 1981-82 data.

[b] 1976 equalized valuation per 1977-78 elementary student ADA.

[c] Districts with bilingual programs receiving state aid.

TABLE 5

Price Index for Selected School Districts in the Chicago Metro Area

	Teacher	Instructional Support Personnel	School Administration	District Administration	Non-Certified Personnel
	(1)	(2)	(3)	(4)	(5)
1. Cook County					
a. Chicago	1.0776	1.0796	1.0638	1.1700	1.1735
b. Oak Park	1.0601	1.0571	1.04971	1.0847	1.1089
c. Evanston	1.0584	1.0548	1.0483	1.0629	1.1024
d. Lincolnwood	1.0619	1.0595	1.0512	.9629	1.1154
e. Cicero	1.0619	1.0595	1.0512	1.0918	1.1154
f. Berwyn	1.0601	1.0571	1.0497	.9720	1.1089
2. Dupage County - Elmhurst	1.0625	1.0551	1.0389	1.1145	1.0543
3. Kane County - Elgin	.9586	.9865	1.0146	1.0959	.8532
4. Lake County - Waukegan	.9964	.9841	1.0153	1.0648	.9494
5. Will County - Joliet	.9667	.900	1.0255	1.0466	.9261

Source: Chambers and Parrish 1982; Appendix I

[a] Index is partly based on school district enrollment