Evaluation of the impacts of Public Law 81-874 aid on financial equalization of public schools in Montana

Curtis M. Nichols
The University of Montana
COPYRIGHT ACT OF 1976

THIS IS AN UNPUBLISHED MANUSCRIPT IN WHICH COPYRIGHT SUBSISTS. ANY FURTHER REPRINTING OF ITS CONTENTS MUST BE APPROVED BY THE AUTHOR.

MANSFIELD LIBRARY
UNIVERSITY OF MONTANA
DATE: 1979
AN EVALUATION OF THE IMPACTS OF PUBLIC LAW 81-874 AID ON FINANCIAL EQUALIZATION OF PUBLIC SCHOOLS IN MONTANA

By
Curtis M. Nichols
B.S., Montana State University, 1968
Presented in partial fulfillment of the requirements for the degree of Master of Arts
UNIVERSITY OF MONTANA
1979

Approved by:

[Signature]
Chairman, Board of Examiners

[Signature]
Dean, Graduate School

10-26-79
Date
ABSTRACT

Nichols, Curtis M., M.A., December 1979 Economics

An Evaluation of the Impacts of Public Law 81-874 Aid on Financial Equalization of Public Schools In Montana (70 pp.)

Director: John H. Wicks

This thesis examined the effect of federal impact aid on financial equalization of public schools. Impact aid, authorized by Public Law 81-874, is distributed to public school districts that educate children who live on or whose parents are employed on tax exempt federal property. This includes reservation Indians.

Montana has several systems to promote equalization of revenues and tax rates of public schools. The analysis compared revenues and tax rates of districts that receive Public Law 81-874 aid to those that did not. These comparisons showed districts receiving Public Law 81-874 aid in general had higher revenues per student and lower tax rates.

Currently federal impact aid funds are not considered by the state in the distribution of state equalization aid. Four alternatives were developed for recognizing federal impact aid in the distribution of state equalization funds. Analysis of the predicted revenues and tax rates resulting from use of these alternatives indicates greater equalization of revenue and tax rates can be accomplished by their use.
CONTENTS

ABSTRACT ......................................................... ii
TABLES ............................................................ v
ACKNOWLEDGEMENTS ............................................ vi

Chapter

I. INTRODUCTION ............................................. 1
   Scope
   Public Law 81-874
   The Potential for Conflict

II. CURRENT SCHOOL FUNDING MECHANISMS ..................... 5
   General Fund
   Transportation Fund
   Tuition Fund
   Retirement Fund
   Comprehensive Insurance Fund
   Public Law 81-874 Revenues - Where Used
   Public Law 81-874 Revenues - Calculation of Entitlements

III. PREVIOUS PUBLIC LAW 81-874 STUDIES .................... 13
   Stanford Research Institute - 1965
   Battelle Memorial Institute Study - 1969
   House Committee on Education and Labor - 1974
   Ginsburg and Killalea - 1975
   Comptroller General - 1976
   Conclusions

IV. METHODOLOGY ............................................... 22
   District Response to Reduced Revenues - The Model Equation
   District Response to Reduced Revenues - The Final Equations
   Alternatives for Offsetting PL 874 Revenues
   Computing Revised Revenues and Taxes

V. DATA .......................................................... 34
   Public School Revenues
   Public School Tax Rates, Taxable Valuations and Enrollments
   Weighted Average Number Belonging
   Taxable Value per Weighted ANB
   Per Capita Income
   Percent of Population Under 18 Years of Age
   County Levied Mills for Operating Funds

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relative Size of Selected Public School Operating Funds</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Average Public Law 81-874 Expenditures by Type of District, 1970</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>District Response to Offsets Against PL 874</td>
<td>28</td>
</tr>
<tr>
<td>4</td>
<td>Classification of Public School Revenues</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>Comparison of ANB and Weighted ANB, Correlation with Revenues</td>
<td>38</td>
</tr>
<tr>
<td>6</td>
<td>Mean Public School Revenues of PL 874 Aided and Non-Aided Districts</td>
<td>45</td>
</tr>
<tr>
<td>7</td>
<td>Mean District Operating Mill Levies of PL 874 Aided and Non-Aided Districts</td>
<td>51</td>
</tr>
<tr>
<td>8</td>
<td>Correlation of Revenues per Weighted ANB and Taxable Values per Weighted ANB</td>
<td>53</td>
</tr>
<tr>
<td>9</td>
<td>Total Revenues per Weighted ANB of PL 874 Aided and Non-Aided Districts Under Various Alternatives for Offsetting PL 874 Aid</td>
<td>55</td>
</tr>
<tr>
<td>10</td>
<td>Mill Levies of PL 874 Aided and Non-Aided Districts Under Various Alternatives for Offsetting PL 874 Aid</td>
<td>56</td>
</tr>
<tr>
<td>11</td>
<td>District Operating Mill Levies and Total Revenues per Weighted ANB of PL 874 Aided Districts Existing in 1975-76 and with Alternative Offsets Taken against PL 874 Revenues</td>
<td>57</td>
</tr>
<tr>
<td>12</td>
<td>Crosstabulation of District Revenues per Weighted ANB and Operating Mill Levies of PL 874 Aided Districts</td>
<td>61</td>
</tr>
<tr>
<td>13</td>
<td>Disparity of Revenues per Weighted ANB</td>
<td>62</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

The primary source of information for this thesis was records maintained by the Office of Public Instruction in Helena, Montana. I am particularly indebted to Stephen Colberg and David Wood for their assistance in obtaining this information and converting it into a form which could be processed by the University of Montana computer. I am also indebted to the staff of the University of Montana Computer Center for their many hours of assistance.

For suggestions and assistance in all phases of this thesis I thank John Wicks and Mike Kupilick of the University of Montana Department of Economics and Lyle Berg of the University of Montana Division of Education Research.
I. INTRODUCTION

This thesis examines the effect that federal public law 81-874 aid has on financial equalization of public schools in Montana. Financial equalization is the product of a system of funding public schools that recognizes cost differences and local resources in an effort to allow different districts to provide an equal education with an equal tax burden. The degree of financial equalization achieved is variously measured by variations in revenues per student, variations of property tax rates necessary to provide similar revenues per student and the correlation of revenues to district taxable valuation per student among the districts of the state.

The examination begins by hypothesizing the following:

1) Public Law 81-874 aid leads receiving districts to higher per student revenues than other districts.

2) Public Law 81-874 aid leads receiving districts to lower district tax rates than other districts.

3) If Public Law 81-874 aid were capitalized as wealth and added to district taxable valuations, a positive correlation between per pupil district wealth and expenditures would be increased.

4) The disparity among districts in revenues per student and tax rates would be reduced by taking account of
Public Law 81-874 aid in the distribution state equalization aid.

Data on revenues and taxes of 587 school districts for the 1975-76 school year provided the basis to test these hypothesis. First the current status of districts was determined. The next step was to develop alternatives for treatment of Public Law 81-874 aid in determining state equalization aid distribution. The final step was to compare results of applying the alternatives with the current status to find if greater financial equalization was accomplished.

Scope

The paper used data from all operating public elementary and secondary schools in Montana. Fiscal year 1976 was the year covered in the analysis.

This paper analyzed five district public school funds:
1) general fund;
2) transportation fund;
3) tuition fund;
4) retirement fund;
5) comprehensive insurance fund.

Public Law 81-874 aid can be used in any of these district operating funds.
Public Law 81-874

Public Law 81-874 was enacted in 1950. Its purpose as stated in the act is:

"...to provide financial assistance for those local educational agencies upon which the United States has placed financial burdens...."

The act goes on to identify burdens resulting from acquisitions of real property by the federal government, provision of education to children who live on or whose parents are employed on federal property, and sudden and substantial increases in school attendance as a result of federal activity. Since the enactment in 1950 amendments have added children of parents in the armed forces, Indian children, and children living in federally subsidized low rent housing.

The Potential for Conflict

The state of Montana operates a system of funding public schools that promotes financial equalization. This system provides state funds to districts with low taxable valuations per student. Public Law 81-874 aid provides aid to districts that may be expected to have low taxable valuation per student as a result of federal activities. This occurs as the federal aid is targeted on school districts which educate children for whom a property tax base in the form of parents' homes or places of work is
absent. A potential for over compensation exists if both systems operate independently. These systems operate independently in Montana.
II. CURRENT SCHOOL FUNDING MECHANISM

The generation and uses of revenues in each of the five funds covered in this thesis is unique. This section explains each one but to start the reader may find it informative to know the relative size of these funds.

*TABLE 1*
Relative Size of Selected Public School Operating Funds

<table>
<thead>
<tr>
<th>Fund</th>
<th>Percent of Fiscal 1976 Revenues of the Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>87</td>
</tr>
<tr>
<td>Transportation</td>
<td>5</td>
</tr>
<tr>
<td>Tuition</td>
<td>Less Than .5</td>
</tr>
<tr>
<td>Retirement</td>
<td>7</td>
</tr>
<tr>
<td>Comprehensive Insurance</td>
<td>Less Than .5</td>
</tr>
</tbody>
</table>

**General Fund**

The general fund is used to finance all general operations and maintenance of the district schools. This includes such items as the salaries of instructional, administrative and support staff, books and teaching supplies and utilities.

The major part of the general fund is financed by the state through a foundation amount or equalized by the state under the permissive amount. The foundation and permissive amounts are fixed proportions of legislative determined
maximum-general-fund-without-a-vote schedules. The foundation amount is 80 percent and the permissive amount is 20 percent of the schedules set in law. The statutory schedules list the maximum-general-fund-without-a-vote per average number belonging (ANB).

The maximum-general-fund-without-a-vote amounts vary by size and type of school from a flat amount of $49,051 for a high school with less than 24 ANB to $639.10 per ANB for an elementary school with more than 300 ANB. The schedules apparently take account of economies of scale present in larger schools. The schedules are separate for high schools and elementary schools with the per ANB payments of high schools being thirty to fifty percent higher than comparably sized elementary schools. If a district operates a junior high school or middle school, the seventh and eighth grades are financed at the high school rate.

The foundation amount is paid to each district without a district levied tax or participation by individual districts. Revenues for the foundation amount come from statewide property mill levies of 15 mills for high schools and 25 mills for elementary schools, appropriations of state general funds, earmarked portions of state personal income, average number belonging is a measure of the number of students in attendance in a school district. The ANB for any year is based on school attendance in the previous year. A detailed description of this concept may be found in Revised Codes of Montana, secs. 75-6902 through 75-6904.
corporate license and coal severance taxes, earnings from rentals of public school lands, interest on public school funds and numerous other minor sources. If appropriated and earmarked funds are insufficient to pay obligations, a statewide property tax is levied.

The full permissive amount is guaranteed a district after the district levies 6 mills if it is a high school district and 9 mills if it is an elementary district. If the levy falls short of raising the full permissive amount, which it does in most districts, the state supplies the remainder. If the districts can raise the full amount on less than the full levy, the state does not participate. If a district chooses to spend less than the full permissive amount, the state and district share in the cost in the same ratio that would have existed had the full permissive amount been used. The district may use revenues received under Public Law 81-874 to meet its share of the permissive amount instead of actually levying a tax on district property.

Special education—educational programs for the mentally and physically handicapped, educationally deprived or learning disabled—is funded fully within the maximum-general-fund-without-a-voted-levy amount. These programs are funded on approval of the state superintendent of public instruction instead of by ANB formula. All approved programs are fully funded 80 percent foundation program and 20 percent permissive. Since most districts
levy the full permissive levy for regular education, this essentially means special education is fully state funded.

If a district wishes to spend more than the maximum allowed by schedules, it must petition the voters of the district for authority. Most districts in Montana do this. There must be voter approval of expenditures in excess of the scheduled amounts no matter what the source of funds, i.e. property taxes or Public Law 81-874. In fiscal 1976 approximately 28 percent of all district general fund revenues were from voted amounts.

**Transportation Fund**

Transportation of pupils is financed by district and county wide tax levies and state appropriations. The state statutorily sets reimbursement schedules for individuals who transport their children and for various sizes of buses. Reimbursement under the schedule is available for all children who live more than three miles from school. Amounts allowed a district by the statutory schedule are shared by district, county and state.

Elementary transportation covered by schedules is financed one-third from state appropriation, one-third from the county assessed 25 mill statewide levy and one-third from district levies. In the case of special education students, the state pays two-thirds and the county one-third.
High school transportation as covered by the schedules is financed one-third from state appropriations and two-thirds from a special county-wide transportation levy. In the case of special education students, the state supplies two-thirds and the county supplies one-third of the revenue.

When a district spends more than the amounts allowed by schedules, either through higher actual cost of operation or by providing transportation to non-eligible students, it must bear this excess cost. This district levies a property tax on the district property to finance its share of costs including excess costs. No vote of the electors is required. The district may elect to use Public Law 81-874 revenues to pay district transportation obligations.

**Tuition Fund**

The tuition fund pays for pupils who attend public schools outside their district of residence. Criteria for determining amount of tuition and circumstances under which a pupil could leave their home district are prescribed by statute. Circumstances allowing pupils to leave their home district primarily relate to convenience and proximity to out-of-district schools.

Elementary school tuition is financed by a non-voted district levy on property. High school tuition is financed from the proceeds of the 15 mill statewide levy.
Retirement Fund

The retirement fund provides employer contributions to retirement systems, unemployment compensation and social security. It is financed by a special county-wide levy on all property in the county.

Comprehensive Insurance Fund

The comprehensive insurance fund pays insurance premiums for property, casualty, liability and other types of insurance. It is financed by a non-voted levy on district property.

Public Law 81-874 Revenues - Where Used

The district may use its Public Law 81-874 revenues in any of the above budgets. However, most districts use these revenues in the general and transportation funds.

Public Law 81-874 Revenues - Calculation of Entitlements

A district may receive funds as a result of a reduction in local revenue resulting from acquisition of real property by the federal government. In this case the maximum payment is the district's current expense tax rate applied to the estimated assessed value of federal property.

A district may receive funds as a result of its educating of children who live on or whose parents live
and/or work on federal property. The law identifies seven categories of such children:

1. Live and work on federal property in same county as district;
2. Live and work on federal property in same state as district;
3. Live on federal property with parent in active military duty or live on Indian lands;
4. Live on federal property;
5. Parents work on federal property in same county;
6. Parents work on federal property in same state;
7. Parents on active military duty.

The calculations of entitlements are based upon a local contribution rate (LCR) and the numbers of students in the various groups above. The LCR is either 1) the average per pupil expenditure made by comparable districts from local sources; 2) 50 percent of the average per pupil expenditure in the state; or 3) 50 percent of the average per pupil expenditure in the United States whichever is the greatest except the rate may not exceed the average per pupil expenditure of the state.

The districts are divided into two groups, one in which children in the categories 1, 2 and 3 compose 25 percent or more of all children in the district, the second in which
these children comprise less than 25 percent. The calculations for the first group is as follows:

1.0 LCR (#1, #2, #3 children)  
.5 LCR (#7 children)  
.45 LCR (#4, #5 children)  
.40 LCR (#6 children)  

Total Entitlement

The entitlement of the second group is calculated as follows:

.5 LCR (#7 children)  
.45 LCR (#4, #5 children)  
.40 LCR (#6 children)  
1.0 LCR (#3 children)  
.9 LCR (#1 children)  

Total Entitlement

There are a number of other distribution formulas and provisions used to determine entitlements. However, due to the relatively minor impact they will not be discussed.
III. PREVIOUS PUBLIC LAW 81-874 STUDIES

Stanford Research Institute - 1965

The federal Office of Education sponsored this study of Public Law 81-874 (PL 874) aid. The study was based on several samples of public school districts using data from the 1959-60 school year. The samples included:

- 5,000 school districts throughout the United States;
- 80 California districts with high PL 874 entitlements;
- 54 large districts, either large city or countywide;
- 5 districts reviewed in depth.

Major emphasis in this study was placed on determining if the federal PL 874 aid was the correct amount to offset the burden created by federal activity. The researchers developed the following equation to represent the burden of federal activity:\(^1\).

\[ F = L_n - L_f \]

where
- \( F \) = federal payment
- \( L_n \) = local revenues of non-federal pupils
- \( L_f \) = local revenues of federal pupils

Analysis carried out on the sample of 54 large districts indicated that in 42 of the districts actual payment

differed by more than ten percent from the calculated burden. In 13 districts the actual payment was fifty percent greater than the calculated burden. The researchers concluded that average entitlement approximates burden but there are great discrepancies. Many districts receive windfalls and some receive less than needed to offset the calculated burden of federal activity.

At the time of this study, fifteen states used various methods to take account of federal PL 874 aid in the distribution of their equalization payments.\(^1\) Seven California and ten Virginia districts were studied by these researchers. These states had provisions to offset federal impact aid in their equalization programs. They calculated in the seventeen districts that it would be justifiable to offset 30 percent of the federal impact aid with individual district offsets ranging from 9 to 47 percent of PL 874 entitlement. The higher offsets appeared in districts where actual payments exceeded burden as calculated previously.

The justifiable offset was related to the specifics of the state equalization program and the closeness of the

\(^1\)Public Law 89-750 which made this illegal was passed in 1966. The prohibition was further strengthened by Public Law 90-526 passed in 1968. In Public Law 93-380 passed in 1974 states were again allowed to consider PL 874 aid in setting state equalization aid distribution.
amount of federal aid to the calculated burden. The report concluded states that have foundation programs with equalization based on assessed values were justified in taking PL 874 aid into account in determining state equalization aid distributions.

Battelle Memorial Institute Study - 1969

The federal Office of Education sponsored this study of public law 81-874. The study was based on questionnaires sent to 4,500 districts across the United States. A selected sample of these districts were interviewed in greater depth.

The researchers found that heavily impacted districts got double payments when PL 874 aid and state equalization payments are taken together. These districts had lower pupil-teacher ratios, high per pupil expenditures and lower tax rates.\(^1\) The study concluded that the prohibition against offsetting of PL 874 aid in state equalization programs tends to reduce the effectiveness of state attempts to provide relatively equal educational opportunities with limited state funds.\(^2\)

\(^1\)Arnold A. Hovey et al, School Assistance in Federally Affected Areas. A Study of Public Laws 81-874 and 81-815, Final Report (Columbus, Ohio: Battelle Memorial Institute [1969]) p. 4-1 to 4-3.

\(^2\)Ibid., p. 4-10.
The study recommended that the proper solution would be to allow states to treat PL 874 aid as an addition to the local tax base in calculating state aid.\textsuperscript{1}

The researchers stated that where PL 874 is given to Indian schools a unique problem exists. They recommended PL 874's use as a tool for dealing with Indian education be continued until a better method can be developed. Indian education problems include high absenteeism, difficulty in attracting teachers and emphasis on arts and crafts which require more classroom space per pupil.\textsuperscript{2}

\textbf{House Committee on Education and Labor - 1974}

This study was aimed at determining the disequalizing effects of PL 874 funds on various state equalization structures. In Montana the researchers determined that the portion of PL 874 funds used to increase district expenditures beyond the maximum-general-fund-without-a-vote amount was disequalizing.\textsuperscript{3}

The researchers after determining that there were disequalizing effects resulting from the absence of offsets to PL 874 funds posed two questions that should be answered

\textsuperscript{1}Ibid., p. 8-10.
\textsuperscript{2}Ibid., p. 8-11 to 8-14.
to insure the federal prohibition against offsetting of PL 874 funds does not serve as an obstacle to equalization. 1) What criteria should be used to determine whether a state has equalized educational resources? 2) If a state has met such criteria, to what extent should PL 874 be counted? This study concluded with alternative criteria for determining state equalization effort and alternatives for offsetting PL 874 aid.¹

Reference to this study was included in Public law 93-380. That law delegated to the commissioner of education the selection of criteria for determining what state equalization programs would qualify to offset PL 874 aid and what methods would be used for offsetting. Ultimately variations of two criteria suggested in this report were adopted; 1) disparity of expenditures between high spending and low spending districts, and 2) percentage of total funds covered under the equalization program.

Ginsburg and Killalea – 1975

This study was performed by the staff of the Office of Assistant Secretary of Health, Education and Welfare for Planning and Evaluation. The study was based on 1970 census data covering 5,065 school districts across the United States. The study compared PL 874 aided districts on the

¹Ibid., p. 30-36.
basis of median family income, equalized property value per student and degree of urbanization. In the analysis of PL 874 funds the researchers looked at "3A" and "3B" funds separately and PL 874 funds in total. ("3A" funds are for children whose parents live and work on federal property, "3B" funds are for children whose parents only work on federal property.)

The researchers found that in the west "3A" funds were well targeted and coincide with district "needs". Districts in the low 25 percent of taxable value received seven times as much aid as districts in the high 25 percent. The distribution of "3B" funds also went in favor of the low value districts at a three to one ratio. These relationships are illustrated in table 2.¹

TABLE 2
Average Public Law 81-874 Expenditures
by Type of District, 1970
(dollars per pupil)

<table>
<thead>
<tr>
<th>District Classification</th>
<th>National</th>
<th>Montana</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;3A&quot;</td>
<td>&quot;3B&quot; Total</td>
</tr>
<tr>
<td>Median Family Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low 25%</td>
<td>4.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Middle 50%</td>
<td>1.7</td>
<td>7.8</td>
</tr>
<tr>
<td>High 25%</td>
<td>.7</td>
<td>7.6</td>
</tr>
<tr>
<td>Equalized Property Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low 25%</td>
<td>5.0</td>
<td>9.0</td>
</tr>
<tr>
<td>Middle 50%</td>
<td>.7</td>
<td>7.2</td>
</tr>
<tr>
<td>High 25%</td>
<td>.6</td>
<td>5.0</td>
</tr>
</tbody>
</table>


Comptroller General - 1976

This study was performed for the House Committee on Education and Labor. The conclusions were based on analysis of 100 selected school districts in seventeen states using 1973 data. Also a sample of 1,671 districts were reviewed for the impact created by PL 874 children.

The researchers found that a state equalization plan working without an offset to PL 874 receipts could allow a school district relatively high expenditures with relatively
low tax rates.\textsuperscript{1} In a correlation analysis of sixteen states relating percent of federal impaction with real property value per pupil, expenditures per pupil, pupil teacher ratios and tax rates the following results were obtained. Higher impacts were related to:\textsuperscript{2}

- lower tax rates in 14 of the 16 states;
- lower pupil teacher ratios in 10 of the 16 states;
- higher expenditures per pupil in 10 of the 16 states;
- lower property values per pupil in 10 of the 16 states.

**Conclusions**

These Public Law 81-874 researchers have generally concluded if PL 874 funds are not recognized in state equalization programs, disequalizing effects can occur. Some districts will achieve high revenues per pupil with low tax rates as a result of PL 874 and state equalization programs operating independently. All studies noted great variations from district to district in the equalizing effect of PL 874 funds.

The great variance from district to district of PL 874 impact and the variance from state to state of equalization programs point to a need to look at states individually.


\textsuperscript{2}Ibid., p. 83.
The manner in which a state equalizes public school revenues as well as the manner in which PL 874 revenues are recognized in the equalization program will together determine the extent of financial equalization accomplished in that particular state. None of these studies have looked at financial equalization in a particular state and analyzed the effect of its system of recognizing PL 874 aid in equalization aid distribution.
IV METHODOLOGY

This analysis of PL 874 revenues' effect on financial equalization in Montana began by comparing the actual tax rates and district operating revenues of PL 874 aided and non-aided districts. This comparison illustrated significant differences in financial equalization relating to PL 874 aid. The next step was to determine the anticipated district response to reduced revenues. The response indicates the extent reduced revenues are made up through higher taxes. Once the district response was estimated, four alternative methods of offsetting PL 874 aid by reducing equalization aid were applied. The district response and amount of PL 874 aid offset predicted new patterns of tax rates and revenues. The new patterns of tax rates and revenues were compared to the pre-offset pattern. The results indicated the effect offsetting of PL 874 aid in determining state equalization aid distribution had on financial equalization.

District Response to Reduced Revenues - The Model Equation

When faced with a reduction in PL 874 or state equalization revenues the alternatives available to the district are limited. It may 1) increase, with voter approval in most cases, district assessed property taxes; 2) reduce revenues (and expenditures); or 3) a combination of 1 and 2. Revenues other than district levied property taxes are
primarily exogenously determined by formula or specific mechanisms and will not respond to the proposed offsets taken against PL 874 revenues. Regression analysis of factors influencing district tax revenues determined the districts' anticipated response in terms of higher taxes and reduced revenues (and expenditures).

The regression equation included factors historically found to determine public school spending. This included per capita income, property tax values per pupil and age distribution of district.¹ In addition, the equation used variables that relate more specifically to the funds included in this analysis. The regression equation and variables were:

\[ T = a + b_1N + b_2V_L + b_3P + b_4C + b_5E + b_6A + b_7B \]

where \( T \) = district assessed tax revenues per weighted ANB²

\( N \) = district non-tax revenues per weighted ANB

\( V_L \) = district taxable valuation per weighted ANB, the logarithm of

\( P \) = district per capita income

\( C \) = district transportation reimbursement from the county per weighted ANB


² The concept of weighted ANB is explained in Chapter V on page 36-37.
E = district enrollment change from previous year
A = average percent of district population under 18 years
B = revenues per weighted ANB of bordering districts

The regression equation in this form yielded the district response to offsets against PL 874 revenues as \( b_1 N \). The term, \( b_1 N \), was the amount districts' assessed tax revenues (T) would be raised to compensate for the offset taken. Note this regression equation predicted district levied tax revenues not total revenues.

District non-tax revenues, primarily composed of PL 874 funds, were available to districts to reduce taxes or increase expenditures. These revenues did not include any state or county equalization funds nor were these revenues reflected in the calculation of state or county equalization funds. This variable corresponds to the "federal aid" found by Denzau as being a significant positive determinant of public school spending.\(^1\) In this model because tax revenues were the dependent variable rather than total revenues the author expected the relationship would be negative. While these non-tax revenues did increase total revenues they were also partly used to pay for what otherwise would be financed by local taxes.

\(^1\)Ibid., p. 242.
Taxable value per weighted ANB served a dual role in the equation representing both price of education and wealth of the district.¹ A higher value indicated greater district property wealth in relation to school enrollment. A higher value also indicated a lower tax rate was needed to obtain a given level of revenues per pupil from local property taxes. Denzau found a similar variable "equalized assessed value per pupil" to be a significant positive determinant of public school spending in all studies he reviewed which used the variable.²

Per capita money income will be a positive determinant of spending and tax revenue if education is a "normal good". Denzau found a similar variable, "median family income", to be a significant positive determinant of school spending in the majority of studies he reviewed.³

County transportation reimbursement represented a measure of the minimum transportation needs of the district. The county pays one-third of transportation costs that meet legal requirements for eligibility and reimbursement rate.⁴


²Denzau, p. 242.

³Denzau, p. 242.

⁴See page 7.
It does not participate in transportation of pupils within three miles of school and only pays based on the amounts allowed by statutory schedule. For this reason it is a measure of the minimum transportation program a district must provide.

The transportation fund was covered in this analysis. The minimum transportation program needed will determine the amount of local revenues that must be available, mostly district tax revenue, to pay the district's share of these costs. Transportation program costs exceeding the minimum may be a function of district wealth, income or tastes.

Enrollment change provided a measure of change in revenues per weighted ANB that result from short-run inflexibility of district expenditures. Districts do not immediately and fully respond to changes in enrollment with corresponding change in teaching staff, number of classrooms or other costly items. Since cross sectional analysis of one years data was the basis for this analysis, a variable that reflects lack of complete adjustment of services to student load was included.

The percent of the population under 18 indicates the involvement of the population in public schools. A high proportion of school age children may be associated with greater relative demand for public school education and a correspondingly high revenue requirement.
The revenues per weighted ANB of bordering districts was used to identify any demonstration effect of adjacent districts on the spending decisions of any particular district. In a study by Wicks and Troxel, a similar variable was found to be a significant positive determinant of public school spending in Montana.¹

District Response to Reduced Revenues - The Final Equations

The regression coefficients were determined through analysis of public school revenues in the 1975-76 school year. A stepwise regression technique was used. Eliminating coefficients that were not significant at the eighty percent level of confidence yields the following results.

Elementary Schools

\[
T = -476.0 + 67.4V + 0.024P - 0.17N
\]

\(R^2 = 0.33\)  
\(F = 14.1\)  
\(\text{degrees of freedom} = 80\)  
\(t\) values in parenthesis

\(\text{Std. error} = 113\)

High Schools

\[
T = -896.5 + 151.0V + 0.055P - 4.23E - 0.24N
\]

\(R^2 = 0.42\)  
\(F = 11.3\)  
\(\text{degrees of freedom} = 57\)  
\(t\) values in parenthesis

\(\text{Std. error} = 196\)

The coefficient of the N term indicates changes in tax revenues anticipated as a result of offsets taken against PL 874 funds. The low R squared values, high standard errors and low level of significance of coefficients show the weak explainative value of the results. Such weakness is common to studies of public school financing. To combat this weakness an alternative response function twenty-five percent higher than that computed was also used. This procedure allowed observation of the sensitivity of results to changes in the anticipated district response to revenue reductions. The computed and alternative values for district response are presented in Table 3.

TABLE 3
District Response to Offsets Against PL 874

<table>
<thead>
<tr>
<th></th>
<th>Computed Response</th>
<th>Alternative Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
<td>.24</td>
<td>.30</td>
</tr>
<tr>
<td>Elementary School</td>
<td>.17</td>
<td>.21</td>
</tr>
</tbody>
</table>

Alternatives for Offsetting PL 874 Revenues

Four alternative methodologies for taking offsets to PL 874 revenues were used to determine new patterns of district taxes and revenues. These were:

1. Full offset of all PL 874 revenues;
2. Partial offset based on requirements specified by U.S. Commissioner of Education;
3. Partial offset based on the ratio of district operating mill levies to total operating mill levies;
4. Partial offset based on relation of district taxable value per pupil to state median.

The full offset would eliminate PL 874 funds as district aid and essentially make it aid to the state in carrying out its equalization program. This occurs as the offset reduces state equalization aid expenditures by the full amount of PL 874 revenues received. The tax and total revenue pattern developed by this offset provided an indication of the situation that would exist if PL 874 funds were not available at all.

The offset was calculated:

\[ O_1 = F \]

where \( O_1 \) = the amount of offset taken against PL 874 funds through this method
\[ F = PL 874 \text{ fund} \]

The U.S. Commissioner of Education describes what he believes to be an acceptable partial offset of PL 874 funds in 45 CFR sec 115.66. The basis for this regulation was the legislation relating to offsetting PL 874 funds. This legislation allowed a state in allocating equalization aid to consider as local resources PL 874 funds in the proportion that local revenues covered under our equalization program are of total local revenues. The commissioner
defined local revenues covered under a state equalization program as:

"...those revenues for current expenditures produced within the boundaries of the local educational agency contributed or taken into consideration in a program of state aid."

Total Local revenues were defined as:

"...revenues for current expenditures of the local educational agency, including revenues for education programs for children needing special services, vocational education, transportation, and the like...excluding all revenues from state and federal sources."

The resulting formula for calculating this offset to PL 874 funds was:

\[
O_2 = F \cdot \frac{L_c}{L_t}
\]

where \(O_2\) = the offset taken against PL 874 funds through this method

\(F\) = PL 874 funds

\(L_c\) = local revenues covered under the state equalization program as defined by the U.S. commissioner of education

\(L_t\) = total local revenues as defined by the U.S. commissioner of education

The third offset was based on the ratio of district levied mills for operating purposes to total mills levied on district property for operating purposes. Since PL 874 is a compensation to school operating funds for a lost tax base the district share should be its proportion of total
operating mill levies on district property. The district levies property taxes for general, transportation, tuition and comprehensive insurance funds. The county levies property taxes on district property for general, retirement, and transportation funds. The state levies property taxes for the general fund. The offset was calculated:

\[ O_3 = F \cdot \left[ 1 - \frac{M_d}{M_d + M_c + M_s} \right] \]

where \( O_3 \) = The offset taken against PL 874 funds through this method

\( F \) = PL 874 funds

\( M_d \) = District levied mills for operating funds

\( M_c \) = County levied mills for operating funds

\( M_s \) = State levied mills for operating funds.

The fourth offset taken against federal funds was based on the amount the taxable value per weighted ANB of the district fell below the state median. This offset allowed PL 874 funds to replace any deficiency in the districts property tax base. The deficiency was assumed to be the amount the districts tax value per weighted ANB was less than the state median taxable value per weighted ANB. The

\^[1]A statewide property tax is levied only if other funds provided for state equalization are insufficient to make payments required by statutory schedules.
amount of PL 874 funds allowed to compens for this difference was calculated by assuming the district levies the state median number of mills for operating funds.

\[
O_4 = F - \left[ \frac{D_m - D_d}{1000} \times M_m \right]
\]

where \( O_4 \) = the amount of offset taken against PL 874 funds through this method

\( F \) = PL 874 funds

\( D_m \) = State median taxable value per weighted ANB

\( D_d \) = Taxable value per weighted ANB of the district

\( M_m \) = State median number of district levied mills for operating funds.

Computing Revised Revenues and Taxes

The offsets generated by the four methods in conjunction with the district response previously computed generated new tax revenues, total revenue and tax rates for each PL 874 receiving district. New tax revenues were computed by:

\[
T_1 = T_0 + rO_1
\]

where \( T_1 \) = Tax revenue per weighted ANB after offset

\( T_0 \) = Tax revenue per weighted ANB before offset

\( r \) = district response to offset

\( O_1 \) = amount of offset per weighted ANB
Total revenue per weighted ANB was then calculated by:

\[ R_1 = R_0 - (1 - r) O_1 \]

where

- \( R_1 \) = total revenues per weighted ANB after offset
- \( R_0 \) = total revenues per weighted ANB before offset

The district's mills levied for operating funds after offsetting was calculated by:

\[ M_1 = M_d + \left[ \frac{rO_1}{D_d} \right] \cdot 1000 \]

where

- \( M_1 \) = number of district levied mills for operating funds after offset
- \( M_d \) = number of district levied mills for operating funds before offset
V. DATA

Data from four hundred twenty elementary school districts and one hundred sixty seven high school districts in Montana were included in the study. This represents all operating public school districts except one elementary district encompassing the Yellowstone Boys Ranch, an institution for troubled young boys. This one district is unique and not typical of the other districts.

Public School Revenues

The basic revenue data on public schools in Montana is reported on the "Annual Report of School Trustees". This report is prepared in the summer following the close of the school term. The report lists in detail the revenue sources for each of the funds maintained by public school districts in Montana. These revenues were grouped into three classifications:

N - local non-tax revenues, funds that are available to the district without district levied taxes and not a part of or recognized in calculations of equalization aid for the district. This includes PL 874 funds.

T - local tax revenues, funds that are the result of district levied property taxes.

Q - state or county equalization revenues, funds from the state or county that are distributed in such a manner as to equalize revenues per weighted ANB of the various districts.
The revenues reported by the districts are shown in table 4 along with their classification according to this scheme.

**TABLE 4**
Classification of Public School Revenues

<table>
<thead>
<tr>
<th>Office of Public Instruction</th>
<th>Percent of Total Revenues Studied</th>
<th>Classification for this Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue Identification</td>
<td>High School</td>
<td>Elementary Study</td>
</tr>
<tr>
<td>General Fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td>District Levies</td>
<td>27.09</td>
<td>23.29</td>
</tr>
<tr>
<td>Tuition Earnings</td>
<td>.48</td>
<td>.41</td>
</tr>
<tr>
<td>Interest</td>
<td>.39</td>
<td>.47</td>
</tr>
<tr>
<td>Miscellaneous Receipts</td>
<td>.31</td>
<td>.35</td>
</tr>
<tr>
<td>County Equalization Aid</td>
<td>19.74</td>
<td>20.87</td>
</tr>
<tr>
<td>State Deficiency Levy</td>
<td>2.31</td>
<td>2.15</td>
</tr>
<tr>
<td>State Equalization Aid</td>
<td>28.44</td>
<td>29.01</td>
</tr>
<tr>
<td>State Impact &amp; Bonus Payments</td>
<td>.19</td>
<td>.41</td>
</tr>
<tr>
<td>State Permissive Levy</td>
<td>5.28</td>
<td>6.90</td>
</tr>
<tr>
<td>Federal Impact (PL 874)</td>
<td>1.96</td>
<td>2.88</td>
</tr>
<tr>
<td>Transportation Fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td>District Levy</td>
<td>2.46</td>
<td>2.64</td>
</tr>
<tr>
<td>Payments from Other Districts</td>
<td>.15</td>
<td>.14</td>
</tr>
<tr>
<td>Pupil Payments</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Interest</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td>Other</td>
<td>.05</td>
<td>.06</td>
</tr>
<tr>
<td>County Transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reimbursement</td>
<td>2.10</td>
<td>.99</td>
</tr>
<tr>
<td>State Transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reimbursement</td>
<td>1.15</td>
<td>.99</td>
</tr>
<tr>
<td>Federal Impact (PL 874)</td>
<td>.11</td>
<td>.14</td>
</tr>
<tr>
<td>Tuition Fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td>District Levy</td>
<td>0.00</td>
<td>.28</td>
</tr>
<tr>
<td>Interest</td>
<td>0.00</td>
<td>a</td>
</tr>
<tr>
<td>Federal Impact (PL 874)</td>
<td>0.00</td>
<td>a</td>
</tr>
<tr>
<td>Retirement Fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest</td>
<td>.09</td>
<td>.07</td>
</tr>
<tr>
<td>County Levy</td>
<td>7.67</td>
<td>7.83</td>
</tr>
<tr>
<td>Comprehensive Insurance Fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td>District Levy</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Interest</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

T = Local Tax Revenue  
N = Local Non-Tax Revenue  
Q = State or County Equalization Revenue  
a = Less than .01 percent  

35  
Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Public School District Tax Rates, Taxable Valuations, and Enrollments

Data specifying tax rates, taxable valuations and enrollments was gathered from "Beginning Year Budgets". These budgets are submitted in late summer preceding the school year which is budgeted. The Office of Public Instruction edits the budgets for accuracy. This document lists the taxable valuations of the districts, the number of approved ANB, the approved amount of foundation and permissive funds, district levied mills for each operating fund and the special education budget approved by the Office of Public Instruction.

The total mills levied for district operating funds was the sum of transportation fund, general fund, tuition fund and comprehensive insurance fund levies as reported in the "Beginning Year Budget".

Weighted Average Number Belonging

Weighted ANB was used in this thesis in all measures that involve per pupil or per student revenues or expenditures. The use of weighted ANB was designed to make comparisons of different sized districts easier by removing effects that are not directly related to quality, diversity or extent of program. Weighting removes the economies of scale and district size effects. Weighting was calculated assuming the foundation program schedules properly account
for economies of scale. The foundation schedule, found in Chapter 69, title 75, RCM 1947, decrease payments for districts with greater ANB. The weighting was calculated from the following formula:

$$ W = \frac{\text{foundation} - 0.8 \times \text{special education}}{\text{minimum foundation}} $$

where

- **W** - weighted average number belonging of the district
- **Foundation** - the district's foundation program payment generated under the provisions of Chapter 69, title 75, RCM 1947. The amount is taken from "Beginning Year Budget".
- **Special Education** - the district's budget for special education approved by the Office of Public Instruction and reported on "Beginning Year Budget".
- **Minimum Foundation** - minimum foundation program amount per student as found on foundation schedules. (This is the amount per ANB for elementary schools with more than 300 ANB and a high school with ANB over 600. In fiscal year 1976 this is $511.28 for elementary districts, and $680.88 for high school districts.)

This weighting formula was tested for goodness of fit with observed data. The actual district operating revenues were regressed on calculated (weighted) ANB and unweighted ANB. Residuals resulting from these equations were analyzed to identify patterns associated with number of ANB or weighted ANB that remain after regression. No indication of a consistent pattern was found.

---

1Sec. 75-6905, R.C.M.
The regression results shown in Table 5 comparing weighted and unweighted students indicates that weighting better reflects actual expenditure patterns by a small degree.

TABLE 5
Comparison of ANB and Weighted ANB
Correlation with Revenues

<table>
<thead>
<tr>
<th>Size (ANB)</th>
<th>Correlated With</th>
<th>( R^2 )</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weighted ANB</td>
<td>Unweighted ANB</td>
<td>Weighted ANB</td>
</tr>
<tr>
<td>Elementar()y Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>Total Revenues</td>
<td>.9927</td>
<td>.9930</td>
</tr>
<tr>
<td></td>
<td>Less:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
<td>.9927</td>
<td>.9930</td>
</tr>
<tr>
<td>40-300(^1)</td>
<td>Total Revenues</td>
<td>.8432</td>
<td>.8237</td>
</tr>
<tr>
<td></td>
<td>Less:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
<td>.8508</td>
<td>.8331</td>
</tr>
<tr>
<td>High Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>Total Revenues</td>
<td>.9932</td>
<td>.9918</td>
</tr>
<tr>
<td></td>
<td>Less:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
<td>.9942</td>
<td>.9928</td>
</tr>
<tr>
<td>Less Than 600(^1)</td>
<td>Total Revenues</td>
<td>.9093</td>
<td>.9108</td>
</tr>
<tr>
<td></td>
<td>Less:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
<td>.9148</td>
<td>.9158</td>
</tr>
</tbody>
</table>

\(^1\)The ANB restricted regressions reflect the school sizes where weighting has its greatest effect.
The natural logarithm of reported taxable value per weighted ANB is used in the development of the district response equation. This variable (called $V_L$) is calculated:

$$V_L = \ln \left( \frac{\text{Taxable Value}}{\text{Weighted ANB}} \right)$$

This form allows a diminishing marginal increase of tax revenues to occur as taxable values per weighted ANB become very large. This would reflect a diminishing marginal utility for education as tax revenues, and total expenditures for education increase.

Offset four was computed using a different specification of taxable value per weighted ANB. In this case the reported taxable value divided by weighted ANB calculated the figure.

$$D_d = \frac{\text{Taxable Value}}{\text{Weighted ANB}}$$

---

1See page 23.
2See page 32.
Per Capita Income

Per capita income estimates for 1974 of the U.S. Department of Commerce, Bureau of the Census provided the basis for per capita income figures used in this thesis.\(^1\) The bureau of census figures did not give per capita income at the school district level. Therefore it was necessary to allocate per capita income to the district level.

High school districts serve relatively large rural areas surrounding the communities in which they are located. The per capita income of high school districts was computed by allocating its students between the incorporated place of location and rest of the county.

\[
\text{Enroll}_{\text{Town}} = \frac{\text{Enroll}_{\text{County}} \cdot \text{Pop}_{\text{Town}}}{\text{Pop}_{\text{County}}}
\]

\[
\text{Enroll}_{\text{Rural}} = \text{Enroll}_{\text{District}} - \text{Enroll}_{\text{Town}}
\]

where

- \(\text{Enroll}_{\text{town}}\) - Portion of district enrollment that lives in incorporated place
- \(\text{Enroll}_{\text{County}}\) - Total high school enrollment in county

Enroll\text{District} - Total high school enrollment in district

Enroll\text{Rural} - Portion of district enrollment that lives out of incorporated place

Pop\text{County} - Population of county

Pop\text{Town} - Population of incorporated place

The tables give population and per capita income figures for incorporated places and counties only. An estimate of the per capita income attributable to the unincorporated part of the county was computed by:

\[ P_{\text{Rural}} = P_{\text{County}} \cdot \text{POP}_{\text{County}} - \sum_{i=1}^{N} \left( P_{\text{Town}_i} \cdot \text{POP}_{\text{Town}_i} \right) / \sum_{i=1}^{N} \text{POP}_{\text{Town}_i} \]

The per capita income of a high school district was then computed by

\[ P_d = \left[ \frac{\text{Enroll}_{\text{Town}} \cdot P_{\text{Town}}}{\text{Enroll}_{\text{District}}} \right] + \left[ \frac{\text{Enroll}_{\text{Rural}} \cdot P_{\text{Rural}}}{\text{Enroll}_{\text{District}}} \right] \]

where

\[ P_d = \text{per capita income of the high school district} \]

\[ P_{\text{Rural}} = \text{Calculated per capita income of non incorporated part of the county} \]

\[ P_{\text{Town}} = \text{Per capita income of incorporated place} \]

The per capita income of elementary districts was taken either as that of the incorporated place in which it is
located or that for the unincorporated portion of the county. The calculation for unincorporated portions of the county is illustrated above. As elementary districts were more numerous and enrolled students from more restricted geographical areas. It was therefore undesirable to compute per capita income in the manner used for high schools.

Percent of Population Under 18 Years of Age

The percent of population under 18 years of age in a district was based upon data from the 1970 census of population. This information was presented for county subdivisions. To obtain figures for school districts a base map of the state showing school districts was overlain on the 246 county subdivisions used in the census. The percent of population under 18 was then found by locating a school district in question and using the figure for county subdivision in which it was located.

County Levied Mills for Operating Funds

The county levies property taxes for district transportation, general and retirement funds. Montana Taxpayers Association was the source of data for this variable. This organization annually publishes a report showing each tax in each county for the school year.

VI. ANALYSIS

This thesis began with three hypothesis about impacts the distribution of PL 874 revenues has on financial equalization in Montana. Restated these hypothesis are:

1) districts receiving PL 874 funds have higher per student operating revenues;

2) districts receiving PL 874 funds have lower district taxes for operating purposes, and;

3) adding the capitalized value of PL 874 aid to the property tax base enhances a positive correlation between taxable value per pupil and total revenues per pupil.

This section first reports the analysis of existing 1975-76 conditions as they relate to each hypothesis. Tests of revenues, tax rates and the correlation of taxable value and revenues indicate acceptance or rejection of the hypothesis. Following analysis of existing conditions, previously developed offsets against PL 874 revenues generate alternative taxes and revenues. The hypothesis are reexamined with the alternative taxes and revenues. Finally, criteria specified by the U.S. Commissioner of Education is examined. These criteria determine if a state is eligible to offset a part of PL 874 revenues in its distribution of equalization aid.

In the following section "aided districts" were defined as those districts who in 1975-76 received more than five
percent of their total revenues from PL 874. The "aided districts" represent 39 percent of the districts receiving PL 874 revenues and account for 82 percent of total PL 874 revenue received by the state.

Existing Conditions: Revenues Per Weighted ANB

In 1975-76 PL 874 aided districts enjoyed total revenues per weighted ANB thirteen percent higher than non-aided districts. Table 6 shows the mean revenues of aided and non-aided districts as well as its composition. The breakdown into the three classifications; local tax revenues, local non-tax revenues which includes PL 874 revenues and state and county equalization revenues follows the scheme previously illustrated.¹

Comparison of aided and non-aided district revenues shows the double bonus of PL 874 aid and equalization aid received by aided districts. The double bonus was the result of two aid mechanisms independently compensating for lower taxable values per student. Aided districts got approximately nine percent more equalization aid per weighted ANB. When all non-tax sources were combined (i.e. local non-tax revenues and equalization revenues) aided districts received considerably more revenues than non-aided districts. PL 874

¹Classification of revenues is found in Table 4 on page 35.
TABLE 6
Mean Public School Revenues of PL 874 Aided and Non-Aided Districts

<table>
<thead>
<tr>
<th>Revenue Classification</th>
<th>Mean Revenue Per Weighted ANB&lt;sup&gt;2&lt;/sup&gt;</th>
<th>PL 874 Aided Districts</th>
<th>Non-Aided Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$1,499</td>
<td>$1,329</td>
<td></td>
</tr>
<tr>
<td>Local Tax</td>
<td>220</td>
<td>403</td>
<td></td>
</tr>
<tr>
<td>Local Non-Tax</td>
<td>308</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>(PL 874)</td>
<td>(270)</td>
<td>(7)</td>
<td></td>
</tr>
<tr>
<td>State and County</td>
<td>972</td>
<td>895</td>
<td></td>
</tr>
<tr>
<td>Equalization</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Elementary Schools     |                                          |                        |                     |
| Total                  | $1,132                                   | $1,039                 |                     |
| Local Tax              | 163                                      | 324                    |                     |
| Local Non-Tax          | 226                                      | 35                     |                     |
| (PL 874)               | (197)                                    | (2)                    |                     |
| State and County       | 743                                      | 681                    |                     |
| Equalization           |                                          |                        |                     |

<sup>1</sup> For classification detail see page 35, Table 4.

<sup>2</sup> Totals may not add due to rounding.

Aided high school districts received 38 percent and elementary districts 35 percent more than non-aided districts. These higher revenues required aided districts to raise less from local property taxes to maintain any given level of total revenues.

PL 874 aided districts in the absence of PL 874 aid could be expected to have lower revenues per weighted ANB.
and high tax rates. This occurs because these districts had lower taxable valuations per weighted ANB. The lower valuation was often the direct result of tax exempt federal property. Therefore, if PL 874 districts were to enjoy revenues and tax rates similar to other districts, revenues from other than local taxes must be higher. Such was the case as pointed out in the previous paragraph. However, when equalization aid and PL 874 aid combined to give aided districts higher expenditure at the same or lower tax rates, over compensation was taking place. Table 6 indicates this was occurring.

The equations developed in Chapter IV to predict districts response to offsets against PL 874 aid can indicate the tax revenues and tax rates expected of aided districts.\(^1\) Using the mean values for aided and non-aided districts and setting \(N = 0\) (i.e. eliminating PL 874 aid) we generate the expected mean tax revenues of aided and non-aided districts. For high schools the equation was

\[
T = -896.5 + 151.0 \ V_L + .055P - 4.23E - .24N
\]

\(^1\)See page 27 for description of these equations.
Allowing non-tax revenues to be zero and using mean values of variables for aided districts gives estimated mean tax revenues per weighted ANB.

\[
T = -896.5 + 151.0(9.486) + .055(3614) - 4.23(97.71) = $321
\]

Following the same procedure for non-aided districts

\[
T = -896.5 + 151.0(9.873) + .055(4353) - 4.23(100.49) = $409
\]

By dividing the estimated mean tax revenues per weighted ANB of each by its respective mean taxable valuation per weighted ANB we get the expected mean mill levy. For aided high school districts

\[
M_1 = \frac{T}{V} = \frac{321}{13174} = .02437 = 24.37 \text{ mills}
\]

and for non-aided high school districts

\[
M_1 = \frac{T}{V} = \frac{409}{19399} = .02108 = 21.08 \text{ mills}
\]

For elementary districts mean tax revenues are computed from the equation

\[
T = -476 + 67.4 V_L + .024P - .17N.
\]
Allowing non-tax revenues to be zero and using mean values of variables for aided districts gives estimated mean tax revenues per weighted ANB.

\[ T = -476 + 67.4(8.677) + .024(3804) = \$200 \]

Following the same procedure for non-aided districts

\[ T = -476 + 67.4(9.716) + .024(4303) = \$282 \]

The expected mean mill levy for aided elementary districts is calculated

\[ M_1 = \frac{T}{V} = \frac{200}{5866} = .03409 = 34.09 \text{ mills} \]

and for non-aided elementary districts

\[ M_1 = \frac{T}{V} = \frac{282}{16581} = .01701 = 17.01 \text{ mills} \]

These results illustrated the need for aid to PL 874 districts. Without aid, PL 874 high school districts would receive on the average $88 less per weighted ANB at tax rates 3.29 mills higher than other districts. Elementary PL 874 districts without aid would receive $82 less per weighted ANB at tax rates more than double that for other districts. The expected lower tax revenue and higher tax rates resulted primarily from the lower mean taxable value per weighted ANB of PL 874 aided districts. The mean taxable value per weighted ANB of PL 874 aided elementary
district was only 35 percent of that for non-aided
districts. The mean taxable value per weighted ANB of aided
high school districts was 68 percent of that for non-aided
districts.

It was this condition of higher taxes and lower
revenues resulting from a reduced property tax base that
equalization and PL 874 funds were designed to compensate.
The proper amount of compensation, while arguable, is
generally believed to be that amount which will allow aided
districts to have revenues equal to the mean of other
districts at tax rates no higher than the mean of other
districts.

The amount of aid required to neutralize the effects of
reduced tax base and higher tax rates was calculated. The
following formula is used.

\[
\text{Aid Required} = \left( \ln \frac{\bar{V}_L_n}{\bar{V}_L_a} \cdot K + \frac{\bar{M}_1_n}{\bar{M}_1_a} \cdot \bar{V}_a \right)
\]

where \( \bar{V}_L \) = the natural logarithm of district taxable
valuation per weighted ANB

\( K \) = coefficient of valuation term as found on page 27

\( M_1 \) = mill levy for district operating funds

\( V_a \) = taxable value per weighted ANB

\( a \) = PL 874 aided districts

\( n \) = non-aided districts
Applying this for high school districts

\[(9.873 - 9.486)\times155.0 + (0.02437 - 0.02108) \times 13174 = 103\]

and elementary districts

\[(9.716 - 8.677)\times67.4 + (0.03409 - 0.01701) \times 5866 = 170\]

The needed aid calculated above was much less than the actual aid received by PL 874 districts. The mean non-tax revenue and equalization revenue of aided high school districts exceeded that of non-aided high school districts by $354 per weighted ANB. The excess for elementary districts was $253 per weighted ANB. Applying these excess revenues to the aided district's need showed the mean aided high school districts over compensated by $251 per weighted ANB and mean aided elementary districts over compensated by $83 per weighted ANB.

Existing Conditions: Tax Rates

In 1975-76 PL 874 aided high school districts enjoyed lower district operating mill levies than non-aided districts while aided elementary districts experienced mill levies similar to other districts. Table 7 points out the actual mean mill levies.
TABLE 7
Mean District Operating Mill Levies of PL 874
Aided and Non-Aided Districts

<table>
<thead>
<tr>
<th>District</th>
<th>Mean District Operating Mill Levy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PL 874 Aided Districts</td>
</tr>
<tr>
<td>High School</td>
<td>12.26</td>
</tr>
<tr>
<td>Elementary School</td>
<td>18.71</td>
</tr>
</tbody>
</table>

It appears the excessive non-tax revenues reported in the previous sections were used to hold down or lower tax rates. The excess revenues calculated for high school districts was considerably greater than that for elementary school districts.

Existing Conditions: Correlation of Revenues and Taxable Values

Education finance reformers have typically focused attention on the relationship between the amount spent on education in a district and its wealth. Reform is directed at breaking a tie, or positive correlation, between districts' property valuations and their public school revenues. Equalization aid and PL 874 revenues, to the extent it actually goes to property poor districts, are directed at neutralizing the correlation of revenues and property values.
The correlation between total revenues per weighted ANB and taxable value per weighted ANB was illustrated in the results of a simple regression:

\[ R_q = a + kV \]

The impact of PL 874 on the relationship was included by capitalizing PL 874 revenues and adding them to district taxable valuation. The PL 874 revenues were capitalized by assuming each district levied the median number of mills to obtain these funds. Therefore

\[
\text{Capitalized PL 874} = \frac{\text{PL 874 Funds}}{\text{Median District Operating Levy}}
\]

The median levy for high schools was 34.87 and for elementary schools was 24.58 mills. To see the effect of PL 874 revenues the regression was carried out with the capitalized value of PL 874 revenues added to the district taxable valuation. Table 8 indicates that there was a positive correlation between revenues and taxable values. In the case of high schools, adding the capitalized value of PL 874 funds increased the positive correlation.
### TABLE 8
Correlation of Revenues per Weighted ANB and Taxable Value per Weighted ANB

<table>
<thead>
<tr>
<th>District</th>
<th>Coefficient of Taxable Value</th>
<th>t Independent</th>
<th>R² Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USING ACTUAL TAXABLE VALUE PER WEIGHTED ANB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>+ .0033</td>
<td>4.95</td>
<td>.12</td>
</tr>
<tr>
<td>Elementary School</td>
<td>+ .0012</td>
<td>5.97</td>
<td>.08</td>
</tr>
<tr>
<td><strong>INCLUDING CAPITALIZE VALUE OF PL 874 REVENUES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>+ .0033</td>
<td>5.62</td>
<td>.16</td>
</tr>
<tr>
<td>Elementary School</td>
<td>+ .0012</td>
<td>6.06</td>
<td>.08</td>
</tr>
</tbody>
</table>

### Altering the Existing Conditions

The first part of this section illustrated that PL 874 aided districts enjoyed greater revenues and lower taxes than non-aided districts. Four alternative methods were selected to recognize PL 874 aid in the distribution of state equalization aid. These offsets affected PL 874 aided districts by reducing revenues and increasing tax rates. The distribution of the impact between revenue reduction and tax increase was determined through previously developed factors.¹ Because the predictive power of these models was so weak an alternative factor was used as well.² The

¹See page 27.
²See Page 28.
factors showing the portion of offset revenues that was made up by increased taxes were listed in Table 3. The four methods used in determining amount of PL 874 to recognize in the state's equalization program were briefly. ¹

Offset 1 - All PL 874 revenues

Offset 2 - The offset proposed by U.S. Commissioner of Education based on the ratio of local equalized revenues to total local revenues

Offset 3 - A part of PL 874 revenues equal to the ratio of district assessed to total assessed mill levies on district property for school operating purposes

Offset 4 - A part of PL 874 revenues remaining after revenues have been applied to compensate for lower than state median district taxable valuation

Table 9 shows that any of the offsets taken resulted in mean revenues of aided and non-aided districts being closer. Offset 2 brought aided high school districts to one percent over non-aided districts. Offset 4 brought aided elementary districts to one percent under non-aided districts. Both resulted in revenues considerably closer than the thirteen percent excess of aided over non-aided districts existing in 1975-76.

¹The offset methodologies are fully described on pages 28 - 32.
### TABLE 9
Total Revenues Per Weighted ANB of PL 874 Aided and Non-Aided Districts Under Various Alternatives for Offsetting PL 874 Aid

<table>
<thead>
<tr>
<th>Offset</th>
<th>High Schools</th>
<th>Elementary Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aided</td>
<td>Non-Aided</td>
</tr>
<tr>
<td>No Offset</td>
<td>$1,499</td>
<td>$1,329</td>
</tr>
<tr>
<td>1 (01)</td>
<td>1,294</td>
<td>1,323</td>
</tr>
<tr>
<td>2 (02)</td>
<td>1,341</td>
<td>1,325</td>
</tr>
<tr>
<td>3 (03)</td>
<td>1,345</td>
<td>1,326</td>
</tr>
<tr>
<td>4 (04)</td>
<td>1,384</td>
<td>1,326</td>
</tr>
</tbody>
</table>

#### ESTIMATED DISTRICT RESPONSE

<table>
<thead>
<tr>
<th>Offset</th>
<th>High Schools</th>
<th>Elementary Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aided</td>
<td>Non-Aided</td>
</tr>
<tr>
<td>1 (01)</td>
<td>$1,310</td>
<td>$1,324</td>
</tr>
<tr>
<td>2 (02)</td>
<td>1,353</td>
<td>1,325</td>
</tr>
<tr>
<td>3 (03)</td>
<td>1,357</td>
<td>1,326</td>
</tr>
<tr>
<td>4 (04)</td>
<td>1,393</td>
<td>1,326</td>
</tr>
</tbody>
</table>

#### ALTERNATIVE DISTRICT RESPONSE

The gains of greater equalization of revenues per weighted ANB must be viewed in light of revised tax rates resulting from the offsets taken. Table 10 shows that any of the offsets resulted in greater equalization of high-school tax rates. The tax rates of elementary districts became more disparate with any offset taken. The use of estimated or an alternative district response to offsets had no significant affect on the results.
TABLE 10
Mill Levies of PL 874 Aided and Non-Aided Districts Under Various Alternatives for Offsetting PL 874 Aid

<table>
<thead>
<tr>
<th>Offset</th>
<th>Mean District Mill Levy for Operating Funds</th>
<th>High Schools</th>
<th>Elementary Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Aided</td>
<td>Non-Aided</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aided</td>
<td>Non-Aided</td>
</tr>
<tr>
<td>No Offset</td>
<td></td>
<td>12.26</td>
<td>19.98</td>
</tr>
<tr>
<td>01</td>
<td>23.06</td>
<td>20.09</td>
<td>37.72</td>
</tr>
<tr>
<td>02</td>
<td>19.52</td>
<td>20.06</td>
<td>34.06</td>
</tr>
<tr>
<td>03</td>
<td>21.67</td>
<td>20.05</td>
<td>35.42</td>
</tr>
<tr>
<td>04</td>
<td>15.52</td>
<td>20.02</td>
<td>27.21</td>
</tr>
</tbody>
</table>

USING ALTERNATIVE DISTRICT RESPONSE

<table>
<thead>
<tr>
<th>Offset</th>
<th>Mean District Mill Levy for Operating Funds</th>
<th>High Schools</th>
<th>Elementary Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Aided</td>
<td>Non-Aided</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aided</td>
<td>Non-Aided</td>
</tr>
<tr>
<td>01</td>
<td>25.76</td>
<td>20.12</td>
<td>42.19</td>
</tr>
<tr>
<td>02</td>
<td>21.34</td>
<td>20.08</td>
<td>37.68</td>
</tr>
<tr>
<td>03</td>
<td>24.03</td>
<td>20.07</td>
<td>39.35</td>
</tr>
<tr>
<td>04</td>
<td>16.33</td>
<td>20.02</td>
<td>29.20</td>
</tr>
</tbody>
</table>

The selection of offset criteria for high schools was clear. The best equalization both in terms of revenues and taxes was achieved using the methods proposed by the U.S. Commissioner of Education. However, in the case of elementary districts the choice was not as clear. Revenues were best equalized under offset method four while tax rates were best equalized without offset. The actual projected revenues and tax rates for each of the PL 874 aided districts is presented in Table 11.
## TABLE 11

District Operating Mill Levies and Total Revenues per Weighted ANB of PL 874 Aided Districts
Existing in 1975-76 and with Alternative Offsets Taken against PL 874 Revenues

<table>
<thead>
<tr>
<th>Dist</th>
<th>No Offset</th>
<th>Offset 1</th>
<th>Offset 2</th>
<th>Offset 3</th>
<th>Offset 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mills Revs</td>
<td>Mills Revs</td>
<td>Mills Revs</td>
<td>Mills Revs</td>
<td>Mills Revs</td>
</tr>
<tr>
<td>21</td>
<td>2.28 1512</td>
<td>12.22 1060</td>
<td>12.10 1065</td>
<td>11.56 1090</td>
<td>12.22 1060</td>
</tr>
<tr>
<td>23</td>
<td>17.51 1270</td>
<td>20.90 1112</td>
<td>20.15 1148</td>
<td>19.71 1168</td>
<td>20.90 1112</td>
</tr>
<tr>
<td>25</td>
<td>5.56 1282</td>
<td>11.89 1078</td>
<td>11.49 1091</td>
<td>10.96 1108</td>
<td>10.92 1109</td>
</tr>
<tr>
<td>26</td>
<td>23.69 1502</td>
<td>29.17 1251</td>
<td>28.52 1281</td>
<td>26.85 1358</td>
<td>29.17 1251</td>
</tr>
<tr>
<td>30</td>
<td>4.12 1152</td>
<td>11.88 964</td>
<td>11.18 981</td>
<td>11.06 984</td>
<td>8.66 1042</td>
</tr>
<tr>
<td>46</td>
<td>0.00 1233</td>
<td>124.55 911</td>
<td>31.77 1151</td>
<td>124.55 911</td>
<td>44.48 1118</td>
</tr>
<tr>
<td>98</td>
<td>54.13 1177</td>
<td>56.14 1120</td>
<td>55.19 1147</td>
<td>55.02 1151</td>
<td>54.22 1174</td>
</tr>
<tr>
<td>328</td>
<td>0.22 900</td>
<td>2.72 787</td>
<td>1.45 844</td>
<td>2.71 788</td>
<td>2.72 787</td>
</tr>
<tr>
<td>373</td>
<td>13.08 884</td>
<td>13.85 834</td>
<td>13.69 844</td>
<td>13.65 847</td>
<td>13.85 834</td>
</tr>
<tr>
<td>400</td>
<td>31.21 1453</td>
<td>48.38 1124</td>
<td>44.83 1192</td>
<td>40.51 1275</td>
<td>42.73 1232</td>
</tr>
<tr>
<td>404</td>
<td>24.07 986</td>
<td>25.69 883</td>
<td>25.28 909</td>
<td>25.05 924</td>
<td>25.69 883</td>
</tr>
<tr>
<td>425</td>
<td>4.80 1443</td>
<td>24.45 1117</td>
<td>22.57 1149</td>
<td>22.25 1154</td>
<td>16.95 1242</td>
</tr>
<tr>
<td>445</td>
<td>9.12 1441</td>
<td>12.75 1076</td>
<td>10.91 1261</td>
<td>12.05 1146</td>
<td>12.75 1076</td>
</tr>
<tr>
<td>476</td>
<td>0.00 1287</td>
<td>21.50 1027</td>
<td>21.12 1032</td>
<td>21.50 1027</td>
<td>9.06 1178</td>
</tr>
<tr>
<td>480</td>
<td>11.76 923</td>
<td>17.20 819</td>
<td>16.41 834</td>
<td>15.92 844</td>
<td>11.76 923</td>
</tr>
<tr>
<td>521</td>
<td>14.81 911</td>
<td>16.23 869</td>
<td>16.02 876</td>
<td>15.85 881</td>
<td>14.81 911</td>
</tr>
<tr>
<td>527</td>
<td>4.25 794</td>
<td>6.04 746</td>
<td>5.83 752</td>
<td>5.87 751</td>
<td>4.25 794</td>
</tr>
<tr>
<td>534</td>
<td>26.84 1144</td>
<td>29.12 1023</td>
<td>28.47 1058</td>
<td>28.21 1071</td>
<td>29.12 1023</td>
</tr>
</tbody>
</table>

**Elementary Districts**
TABLE 11 - Continued

<table>
<thead>
<tr>
<th>Dist No Offset</th>
<th>Offset 1 Mills Revs</th>
<th>Offset 2 Mills Revs</th>
<th>Offset 3 Mills Revs</th>
<th>Offset 4 Mills Revs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mills</td>
<td>Revs</td>
<td>Mills</td>
<td>Revs</td>
<td>Mills</td>
</tr>
<tr>
<td>536</td>
<td>12.03 1023</td>
<td>12.42 971</td>
<td>12.36 980</td>
<td>12.32 986</td>
</tr>
<tr>
<td>576</td>
<td>52.89 1031</td>
<td>56.37 953</td>
<td>53.90 1008</td>
<td>54.46 996</td>
</tr>
<tr>
<td>581</td>
<td>25.11 832</td>
<td>27.24 782</td>
<td>26.61 797</td>
<td>26.46 800</td>
</tr>
<tr>
<td>595</td>
<td>43.18 933</td>
<td>46.75 854</td>
<td>45.53 881</td>
<td>44.89 895</td>
</tr>
<tr>
<td>597</td>
<td>31.63 1101</td>
<td>33.60 1025</td>
<td>32.94 1051</td>
<td>32.73 1059</td>
</tr>
<tr>
<td>598</td>
<td>45.14 1312</td>
<td>46.20 1256</td>
<td>45.66 1284</td>
<td>45.64 1286</td>
</tr>
<tr>
<td>614</td>
<td>3.92 1120</td>
<td>6.97 1036</td>
<td>5.34 1081</td>
<td>6.68 1044</td>
</tr>
<tr>
<td>647</td>
<td>30.59 1145</td>
<td>31.42 1096</td>
<td>31.10 1115</td>
<td>31.02 1120</td>
</tr>
<tr>
<td>670</td>
<td>18.34 1210</td>
<td>142.59 954</td>
<td>130.36 963</td>
<td>99.55 1043</td>
</tr>
<tr>
<td>775</td>
<td>22.83 1373</td>
<td>30.42 1053</td>
<td>28.23 1145</td>
<td>27.62 1171</td>
</tr>
<tr>
<td>780</td>
<td>32.89 1015</td>
<td>35.93 918</td>
<td>34.89 951</td>
<td>34.54 962</td>
</tr>
<tr>
<td>782</td>
<td>30.87 1310</td>
<td>62.62 969</td>
<td>57.31 1026</td>
<td>48.62 1120</td>
</tr>
<tr>
<td>792</td>
<td>0.00 1068</td>
<td>54.30 860</td>
<td>54.20 886</td>
<td>54.30 860</td>
</tr>
<tr>
<td>800</td>
<td>23.22 1043</td>
<td>24.94 931</td>
<td>24.68 948</td>
<td>24.20 979</td>
</tr>
<tr>
<td>807</td>
<td>19.40 1380</td>
<td>20.10 1276</td>
<td>19.87 1310</td>
<td>19.85 1313</td>
</tr>
<tr>
<td>809</td>
<td>40.00 1087</td>
<td>45.89 938</td>
<td>44.60 971</td>
<td>42.74 1018</td>
</tr>
<tr>
<td>814</td>
<td>2.48 822</td>
<td>4.31 775</td>
<td>4.16 779</td>
<td>4.19 778</td>
</tr>
<tr>
<td>881</td>
<td>6.33 966</td>
<td>6.60 912</td>
<td>6.57 917</td>
<td>6.55 921</td>
</tr>
<tr>
<td>925</td>
<td>37.96 1089</td>
<td>42.11 976</td>
<td>40.62 1016</td>
<td>40.09 1031</td>
</tr>
<tr>
<td>927</td>
<td>12.72 1082</td>
<td>20.73 799</td>
<td>19.23 852</td>
<td>18.80 867</td>
</tr>
<tr>
<td>934</td>
<td>29.80 1278</td>
<td>30.92 1209</td>
<td>30.46 1237</td>
<td>30.44 1238</td>
</tr>
<tr>
<td>940</td>
<td>0.00 1065</td>
<td>44.83 798</td>
<td>41.49 818</td>
<td>44.83 798</td>
</tr>
<tr>
<td>989</td>
<td>20.48 1029</td>
<td>21.17 970</td>
<td>20.91 992</td>
<td>20.93 990</td>
</tr>
<tr>
<td>1119</td>
<td>19.95 1036</td>
<td>22.84 967</td>
<td>22.39 977</td>
<td>21.85 990</td>
</tr>
<tr>
<td>1201</td>
<td>24.90 1305</td>
<td>40.00 906</td>
<td>35.98 1012</td>
<td>34.25 1058</td>
</tr>
<tr>
<td>1207</td>
<td>0.00 1498</td>
<td>309.93 1013</td>
<td>283.67 1054</td>
<td>309.93 1013</td>
</tr>
<tr>
<td>1210</td>
<td>12.98 822</td>
<td>14.76 784</td>
<td>14.60 787</td>
<td>14.35 793</td>
</tr>
</tbody>
</table>
### TABLE 11 - Continued

<table>
<thead>
<tr>
<th>District Operating Mill Levies and Total Revenues per Weighted ANB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dist</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>31</td>
</tr>
<tr>
<td>401</td>
</tr>
<tr>
<td>426</td>
</tr>
<tr>
<td>475</td>
</tr>
<tr>
<td>481</td>
</tr>
<tr>
<td>680</td>
</tr>
<tr>
<td>776</td>
</tr>
<tr>
<td>783</td>
</tr>
<tr>
<td>797</td>
</tr>
<tr>
<td>815</td>
</tr>
<tr>
<td>926</td>
</tr>
<tr>
<td>928</td>
</tr>
<tr>
<td>937</td>
</tr>
<tr>
<td>1189</td>
</tr>
<tr>
<td>1190</td>
</tr>
<tr>
<td>1191</td>
</tr>
<tr>
<td>1213</td>
</tr>
<tr>
<td>1214</td>
</tr>
</tbody>
</table>

High Schools
This table illustrates the great variability of district tax rates and revenues. Districts like elementary district 595 levied high tax rates yet had low total revenues. Other districts like elementary district 527 levied minimal tax rates and got by with minimal total revenue. Yet other districts like elementary district 400 levied above average tax rates to maintain above average expenditures. This great variability somewhat reduces the value of looking at mean tax rates or mean revenues per weighted ANB. Table 12 provides an alternative way of looking at the 46 elementary and 18 high school districts that received five percent or more of their total revenues from PL 874 funds.

Table 12 indicates that very few aided districts had both higher than average tax rates and lower than average revenues per weighted ANB. No aided high schools and only three aided elementary schools fell in this category. At the other end of the scale many districts had both high revenues per weighted ANB and low tax rates. The offsets raised tax rates and lowered revenues per weighted ANB from those in existence. This meant for the districts affected, if tax rates were high or revenues were low or both, offsetting provided no relief. It was apparent that while these offsetting methods equalized the means of aided and non-aided districts, they had serious negative impacts on
TABLE 12
Crosstabulation of District Revenues per Weighted ANB and Operating Mill Levies of PL 874 Aided Districts

<table>
<thead>
<tr>
<th>District</th>
<th>Offset</th>
<th>Number of Districts</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>A and B</td>
<td>Neither A nor B</td>
</tr>
<tr>
<td>Elementary</td>
<td>None</td>
<td>34</td>
<td>23</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>18</td>
<td>15</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>23</td>
<td>15</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>22</td>
<td>15</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>27</td>
<td>19</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>High School</td>
<td>None</td>
<td>13</td>
<td>14</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>6</td>
<td>9</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9</td>
<td>10</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>9</td>
<td>11</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>10</td>
<td>14</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

A = Revenues per weighted ANB above mean of non-aided districts
B = District operating mill levy below mean of non-aided district

some aided districts. Offset four had the least negative impact of forcing districts into high tax - low revenue situations while at the same time reducing the number of low tax - high revenue districts.

Legal Criteria for Offsetting - Disparity

Public Law 93-380 authorized the states to recognize PL 874 aid in the distribution of state equalization aid. The selection of criteria under which states would qualify to offset PL 874 revenues with reductions in state equalization aid was left to the U.S. Commissioner of Education.
The U.S. Commissioner of Education has made a disparity standard an optional criteria to determine if states may recognize PL 874 revenues in their state aid distributions. This criteria allows the revenues per weighted ANB available for the student at the 95th percentile of revenues per weighted ANB to be no more than 25 percent higher than the revenues per student available at the 5th percentile. If the range between 5th and 95th percentile exceed 25 percent, the state would not be eligible under this criteria to recognize PL 874 aid in its state aid distribution. In 1975-76 the actual separation between these percentiles was forty-eight percent for high schools and sixty-five percent for elementary schools. The state clearly did not qualify under this standard. The four offsets did little to reduce the disparity as Table 13 indicates.

### TABLE 13
Disparity of Revenues per Weighted ANB

<table>
<thead>
<tr>
<th>Offset</th>
<th>High School Districts</th>
<th></th>
<th></th>
<th>Elementary Districts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revenues Per Wtd ANB</td>
<td>%</td>
<td>Revenues Per Wtd ANB</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>5th %ile</td>
<td>95th %ile</td>
<td>Dif.</td>
<td>5th %ile</td>
<td>95th %ile</td>
<td>Dif.</td>
</tr>
<tr>
<td>None</td>
<td>$1110</td>
<td>$1646</td>
<td>48</td>
<td>$794</td>
<td>$1312</td>
</tr>
<tr>
<td>1</td>
<td>1087</td>
<td>1614</td>
<td>48</td>
<td>781</td>
<td>1312</td>
</tr>
<tr>
<td>2</td>
<td>1096</td>
<td>1625</td>
<td>48</td>
<td>782</td>
<td>1312</td>
</tr>
<tr>
<td>3</td>
<td>1087</td>
<td>1633</td>
<td>49</td>
<td>785</td>
<td>1312</td>
</tr>
<tr>
<td>4</td>
<td>1110</td>
<td>1625</td>
<td>46</td>
<td>794</td>
<td>1312</td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Legal Criteria for Offsetting - Wealth Neutrality

Federal regulations include a "wealth neutrality" standard as an optional criteria to determine if a state is eligible to recognize PL 874 revenues in their state aid distributions. The standard requires that at least 85 percent of a district's total operating revenues be "wealth neutral revenues".\(^1\) Applying the definition of these revenues found in the code of federal regulations to Montana, elementary districts had 76.2 percent wealth neutral revenues and high school districts had 77.2 percent wealth neutral revenues in 1975-76. Wealth neutral revenues in Montana include equalization revenues, the district share of the permissive amount and the amount districts would realize from their mill levels if their taxable value per weighted ANB were equal the lowest value per weighted ANB of all districts.\(^2\)

Montana did not qualify under this standard nor would it under any of the studied offsets.

\(^1\)45 CFR 115.64.

\(^2\)As classified on page 35.
VII. CONCLUSIONS AND RECOMMENDATIONS

The analysis clearly indicates that PL 874 aided districts enjoyed higher average revenues per weighted ANB. The breakdown of revenues for aided and non-aided districts showed a pattern of higher state and county equalization and much higher non-tax revenues in aided districts. Revenues from local taxes were lower in aided districts reflecting both the smaller yield from any given tax rate and in the case of high schools the lower tax rates. The levels of revenues in aided districts and their composition gave a strong indication that PL 874 was a causative factor in determining these higher revenue levels. The double bonus of state and county equalization and PL 874 aid generally exceeded the amount needed to offset these district's low valuations per weighted ANB.

Aided high school districts levied smaller mean tax rates for district operating funds. The mean tax rate for aided elementary districts was slightly above the mean for non-aided districts. The bulk of aided elementary districts with average or above average tax rates were levying these rates to receive above average revenues. These districts were not just trying to reach the average or maintain a minimal level of revenue.

When the capitalized value of PL 874 aid was added to the existing taxable value of high school districts, the
positive correlation between revenues and taxable value was increased. In elementary schools the effect was insignificant. It appears that in high school districts the PL 874 revenues exceeded the amount required to compensate for smaller tax bases found in PL 874 aided districts.

Recognizing PL 874 aid in the distribution of state equalization aid will result in greater equalization. All the offset methods studied in this thesis moved mean revenues per weighted ANB of aided districts closer to equaling mean revenues per weighted ANB of non-aided districts. At the same time in high school districts all offset methods moved mean tax rates of aided districts closer to equalling that of non-aided districts. Only in elementary districts did offsets result in creating a greater disparity in tax rates with all offsets forcing mean tax rates of aided districts above non-aided districts.

The analysis did not find any of the four offset methods to be clearly superior to the others. Three of the four offsets forced some districts to very high tax rates to maintain minimal revenue levels. Due to the imprecision in forecasting expected mill levies, many of the extreme values predicted are suspect. However, high rates can be expected in some property poor districts. The problem of high tax rates to maintain minimal revenue levels existed in non-aided districts as well. This problem was probably the result of insufficient minimum state equalization levels.

65
The 75-76 levels left the bulk of districts dependent on local taxes for a substantial part of their operating budget. For the very poor districts even very small amounts of tax revenues come with very high tax rates. At one extreme, one elementary district would have to levy over thirty mills to obtain $10 per weighted ANB.

Montana did not qualify in 1975-76 under either the federal disparity or wealth neutrality standards to recognize PL 874 payments in its distribution of state aid. None of the offsets applied would have allowed Montana to meet either of these standards as well. This researcher questions the validity of the federal disparity standard as it only looks to equalization at the extreme and does not take into account the local effort of districts. For example, the mean tax rate for high school districts that exceed the 95th percentile of revenues per weighted ANB is twice that of those falling below the 5th percentile. Obviously there was more to being in the extreme than lack of equalization in the property tax base. If the district in the lower five percent had made the same effort as those in the highest five percent, or vice versa, the disparity between these percentiles would have been greatly reduced.

Much PL 874 aid in Montana goes to districts that educate Indian children. It has been suggested that PL 874
aid is properly used as a tool to deal with unique problems of Indian education. While there are unique problems that may make Indian education more expensive, PL 874 aid calculations are not based on any factors that relate to these unique characteristics. To prevent states from recognizing PL 874 aid on the grounds it represents support for Indian education would be inappropriate. Montana in 1975-76 provided full state funding for special education programs. In addition federal Johnson O'Malley and Elementary and Secondary Education Act Title I funds are targeted on these Indian districts (these funds were not covered in this thesis).

As is the case with any research effort, more questions were raised than answered. Some directions for further research discovered in work on this paper are discussed briefly.

The development of the district's anticipated response to changed state equalization revenues is weak. This relationship may be more accurately determined from time-series data with some categorization of school districts. While in general conclusions were not highly sensitive to changes in the anticipated district response, the response factor used appeared inappropriate to very low and very high aided districts.

---

1Hovey, pp. 8-11 to 8-14.
Much of PL 874 aid is targeted on Indian children and correspondingly many of these districts have very high expenditure levels. Before a program of offsetting these revenues is actually implemented, the use of excess revenues by Indian districts should be studied to determine impacts that may result if aid is reduced.

The results have shown PL 874 aid working against state financial equalization efforts yet federal guidelines prohibiting the state from recognizing of PL 874 aid in distribution of equalization aid. These federal guidelines are strongly dependent on the states overall level of equalization. They do not particularly relate to the impact of PL 874 aid on financial equalization or the state equalization program's effects on PL 874 districts. This situation can result in preventing a state from taking action relating to PL 874 aid when that aid is working against equalization. The state is constrained because it has not achieved levels of equalization desired by the federal government. This researcher believes equitable treatment of PL 874 aided districts and the overall equalization of public school revenues may in fact be separate issues.

These findings lead one to recommend that the state and federal government should seek an acceptable method of recognizing PL 874 aid not related to overall state equalization program. Such a method could be based on guaranteeing PL 874 aid is not offset when a district's revenues per
ANB fall below an agreed level or percentile. Of course, the districts should be expected to levy taxes in some relationship to its desired expenditure level relative to non-aided districts expenditure levels and tax rates. The state should then be allowed to offset revenues that lead districts to relatively high expenditure levels with low tax rates. This "robinhood" effect is currently at play in the collection and distribution of state wide property tax revenues. It seems logical to extend it to cover these quasi "in lieu of taxes" revenues.


Hovey, Arnold A; and Others, School Assistance in Federally Affected Areas. A Study of Public Laws 81-874 and 81-815, Final Report. Columbus, Ohio: Battelle Memorial Institute, [1969].


Spiegelman, Robert G.; and Others, Entitlements for Federally Affected School Districts under Public Laws 874 and 815. Menlo Park, California: Stanford Research Institute, [1965].


