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ABSTRACT

This paper presents findings of a study that determined if there is a significant relationship between federal expenditures for education and federal expenditures for public assistance. Data on federal primary and secondary educational expenditures, federal public-assistance expenditures, the number of public-assistance recipients, the enrollment in public primary and secondary schools, and annual inflation rates for 1959-91 were obtained from publicly available reports of several federal agencies. Indices were developed in order to deflate the educational and public-assistance expenditures and to remove the effects of population changes, inflation, benefits per recipient changes, and student-enrollment changes. To allow for a delayed reaction, the deflated public-assistance expenditures were shifted year by year and correlated with the deflated educational expenditures. When the public-assistance expenditures were shifted 12 years in relation to the educational expenditures, there was a significant correlation of r=-.907. A linear regression of filtered public-assistance expenditures that was shifted 12 years in relation to filtered educational expenditures indicated an inverse relationship of $1.82 of public-assistance expenditures for each $1 of educational expenditures. Recommendations for further study are offered. Appendices contain statistical tables and four figures. (Contains 10 references.) (Author/LMI)

THE RELATIONSHIP OF FEDERAL EDUCATIONAL EXPENDITURES AND FEDERAL PUBLIC ASSISTANCE EXPENDITURES

by

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A research paper

submitted in partial fulfillment

of the requirements for ASE 579 - Methods of Research

Sam Houston State University

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CHAPTER I

INTRODUCTION

General Introduction

Today's political climate is concerned with shrinking government and budget reductions. The budget reduction approaches currently used tend to infer the sacrificial approach of 'doing without' as opposed to an efficiency approach of better utilization of scarce resources. The efficient use of scarce resources requires an understanding of the relationships of various budget items. Depending on how the budget items are related, a decrease in expenditures in one item could cause a significant increase in expenditures for the related budget item. Dysfunctional utilization of resources and operating deficits could occur.

Statement of the Problem

The amount of taxation necessary to fund our current level of federal, state, and local government is a concern for taxpayers, legislators, and public services administrators. A desire to reduce taxation has both federal and state legislatures examining all budget items for possible reduction, and public services administrators examining methods of coping with the expected cuts.

Purpose of the Study

The purpose of this study is to determine if there is any relationship between the expenditures for education and the expenditures for public assistance.

Importance of the Study

Identification of the relationship between educational expenditures and public assistance expenditures might prove useful in the allocation of government funds.

Definition of Terms

1. Per Capita. By or for each person

2. Across the board. All items treated exactly the same way

3. Public assistance. Federal assistance to near and below poverty level individuals and families for the purpose of mitigating the effects of poverty; includes Aid to Families with Dependent Children (AFDC), emergency assistance, Food Stamp Program, Economic Opportunity Act, Comprehensive Employment and Training Act, National School Lunch Act, and Child Nutrition Act; excludes Supplemental Security Income, Medicaid, and all forms of social insurance

4. Educational expenditures. Federal funds expended in providing primary and secondary education; includes grants for the disadvantaged, school improvement programs, Indian education, education for the handicapped, vocational and remedial adult education; excludes Head Start, Job Corps, Defense Department overseas dependents' schools, school lunch programs

5. Inflation Index (1959 Base). An index measuring the relative change in value of the U.S. Dollar since 1959; used to deflate expenditures after 1959 to 1959 constant dollars

6. Population Index (1959 Base). An index measuring the relative change in the total U.S. population since 1959; used to deflate expenditures after 1959 to 1959 constant expenditures per capita

7. Student Index (1959 Base). An index measuring the relative change in the total U.S. public primary and secondary school enrollment since 1959; used to deflate federal

expenditures for primary and secondary public education since 1959 to maintain a constant 1959 student to population mix

8. Public Assistance Index (1959 Base). An index measuring the relative change in AFDC benefits per recipient since 1959; used to deflate federal public assistance expenditures since 1959 to 1959 constant benefit dollars

9. Filtered expenditures. Expenditures that have been deflated for the effects of population, inflation and student enrollment or benefit changes

Null Hypothesis

There is no significant relationship between federal expenditures for primary and secondary education and federal expenditures for public assistance.

Limitations and Delimitations

This study is limited to expenditures by the United States of America. It is delimited to public primary and secondary education expenditures and public assistance expenditures for the years 1959 through 1991.

Assumptions

1. There is uniformity in educational effectiveness per dollar of expenditure throughout the states.

2. There is equal opportunity for employment throughout the states or the work force is mobile and can move to the sources of employment.

3. There is uniform level of compensation for varying degrees of experience, education, and training.

CHAPTER II

REVIEW OF RELATED LITERATURE AND RESEARCH

Importance of Education To Reducing Poverty

President Johnson was responsible for the federal government's first large scale effort to use education in an attempt to break the cycle of poverty.[1] Using increased education and job training as a means to reduce poverty is supported by many research studies. Schultz postulated that schooling was valuable because it allowed the flexibility to make occupational changes and to move to where the jobs were. Furthermore, he believed that one component of the value of education was increased income. He supported his belief by referencing studies by Zeman, Glick, Miller and Houthakker that correlated educational attainment to income. Zeman's 1955 research identified educational attainment as the major reason for income differentials between whites and non-whites.[2] Taylor and Chatters's study in 1988, indicated that educational attainment was still the strongest predictor of family income among poverty stricken elderly blacks. They reported that their findings were consistent with research by Farley in 1984 and R.J. Taylor and W.J. Taylor in 1982.[3] Considering the empirical findings that educational attainment is predictive of income for the general population as well as the impoverished, one would expect to find that lack of educational attainment is related to poverty. In a 1987 national survey of 202 low income families, 58 percent of the respondents indicated that additional education or job training was needed for them to obtain the kinds of jobs needed to support their families. They felt the federal government's approach to ending poverty

should be to provide jobs (41 percent) and to provide education and or job training (25 percent).[4]

The Effect of Poverty on Educational Attainment

Theodore Schultz observed that even with free tuition many children did not avail themselves of educational opportunities. His theory is that foregone earnings of the student is the largest single cost of education. Furthermore, he hypothesized that as income rises, the age at which children are expected to earn income also rises[5]. This would lead one to expect children from poor families to drop out of school more frequently than children from more affluent families. Children of poor families drop out of school at 150 percent of the rate for the general population. Of the respondents to the 1987 survey, 25 percent identified a need to help support their families and 18 percent identified getting married or pregnant as the major reasons for dropping out of school.[6]

When Education and Job Training Fail

David Savage criticized the federal government's efforts through Title I, Elementary and Secondary Education Act (ESEA), renamed Chapter I, Education Consolidation and Improvement Act (ECIA) as having failed to provide any significant difference in reading skills when measured at the middle school level. Savage speculates that there are three major reasons. First, the curriculum used to teach basic reading skills is not interesting or relevant to children. Therefore, the children do not receive long term benefits in relation to privately educated children because the Chapter I curriculum bores them. Second, the federal government's standards of keeping Title I services separate from and in addition to local services resulted in inefficient utilization of funds. Team teaching and other cooperational or integrated educational programs could not be used

because of a lack of ability to trace the federal funds. Finally, Savage felt that the government spread the funds too thin to be effective. He theorized that the concentration of funds in the areas of greatest poverty would have been more effective than allocating funds to all school districts according to the amount of poverty in their district.[7]

Although 58 percent of the respondents to the 1987 national survey identified a need for additional education or job training, they cautioned that job training and education will not provide additional income unless jobs exist. Many of the respondents had some job training but did not benefit from the training because it was not linked to a job.[8] A study of poverty in Appalachia also questioned the value of education in an area with few jobs that even required a high school diploma.[9]

Most of the growth in new jobs will require increased education and skill levels. More education and greater skill levels will be needed to obtain the types of jobs necessary to have the income to avoid poverty.[10] Taylor and Chatters reported that Duncan's research found that increased educational attainment among young and middle aged blacks had not translated into increased economic opportunities.[11]

Effectiveness of Education and Job Training in Reducing Public Assistance

Schwienhart, Koshel, and Bridgeman reported that the High/Scope Educational Research Foundation found that a good one-year preschool program for disadvantaged children returns six dollars to taxpayers for every dollar invested.[12] However, a recent study of 33,000 California welfare mothers indicated that only 76 cents was saved for every dollar invested in improving skills. It was noted that Riverside County managed to increase its savings to $2.84 per dollar invested because it provided job placement services with the training.[13]

CHAPTER III

METHODS AND PROCEDURES

Data Sources

Data were collected from publicly available reports of statistical records of several federal agencies (see Table 1). To obtain data for the study period 1959 through 1991, data had to be collected from several years' series of the same report. The latest version of the data was used to reduce the effects of corrections to previously issued reports. Due to a lack of comparability in some data before 1959 and a lack of some data past 1991, the study was limited to 1959 through 1991.

Table 1 Data Sources

Department of Commerce[14]	Population of the U.S.
	Annual Inflation Rates
Department of Health and Welfare[15]	Public Assistance Expenditures
	AFDC Expenditures
	AFDC Recipients
Department of Education[16]	Primary and Secondary Education Expenditures
	Enrollment in Public Schools

Data Manipulation

Several extraneous factors effect the expenditures for education and the expenditures for public assistance. These factors are general population growth, a change in the percentage of the school age population in relation to the general population, a

change in the public assistance benefits per recipient, and inflation. Indices were created for each of these parameters (see Table 3). These indices were used to eliminate the effects of the extraneous variables from the study.

The effect of population growth must be eliminated from the expenditures for both education and public assistance. If the mix of students or recipients to the general population were fixed and the cost per student or benefits per recipient were fixed, then a growth in population would cause a positive correlation between educational expenditures and public assistance. A population index with a base year of 1959 was created by dividing the U.S. population for each year from 1959 to 1991 by the population in 1959 (see Table 3). Expenditures for education and for public assistance were deflated by dividing the actual expenditures for each by the population index. This results in eliminating the effects of population growth on the expenditures (see Table 4, Table 5, Figure 2 and Figure 3).

The effect of a change in benefits per recipient is an extraneous variable that effects the study. To eliminate the effects of this variable, the index for public assistance was prepared using AFDC data (see Table 3). The expenditures for AFDC benefits were divided by the number of recipients for each year to obtain the benefits per recipient per year. Each year's benefits per recipient were then divided by the 1959 benefits per recipient to generate an index of benefits based on 1959 funding formulae. The population deflated expenditures for public assistance were then further deflated by dividing by the public assistance index. This results in eliminating the effect of changes in public assistance funding formulae from the public assistance expenditures (see Table 4 and Figure 2).

An increase or decrease in the school age population in relation to the general population is another extraneous variable that effects the study. The effects of this variable

are eliminated by dividing the population deflated expenditures for education by the student index. The student index was derived by dividing the student population in public primary and secondary schools by the 1959 student population (see Table 3). This results in eliminating changes in expenditures due to changes in student population (see Table 5 and Figure 3).

Finally, inflation also effects the expenditures for both education and public assistance. The cumulative effect of inflation for each year since 1959 was calculated by multiplying the previous year's compound inflation factor by the current inflation rate. The inflation index based on 1959 dollars was calculated by dividing each year's compound inflation factor by the 1959 factor (see Table 3). The educational expenditures deflated for population growth and student mix were further deflated for the effects of inflation by dividing by the inflation index. This results in educational expenditures in constant 1959 dollars (see Table 5 and Figure 3). The public assistance expenditures deflated for population growth and benefit changes were further deflated for the effects of inflation by the same process used on the educational expenditures (see Table 4 and Figure 2).

If the indices used to deflate the actual expenditures are valid, then the deflating of the actual expenditures for the various extraneous variables has the effect of filtering out the effect of the extraneous variables. Thus the extraneous variables should not effect the correlation of the filtered expenditures.

Correlation of Data

A Pearson product moment correlation analysis was done on the filtered expenditures for education with the filtered expenditures for public assistance. Since the purpose of the study is to determine whether or not there is a relationship between

educational expenditures and public assistance expenditures and since a change in the expenditures for primary and secondary education could take many years to have an effect on public assistance needs, sixteen correlations were done on data by matching successive one year shifts between the filtered educational expenditures and the filtered public assistance expenditures. For example, 1959 through 1990 filtered educational expenditures were correlated against 1960 through 1991 filtered public assistance expenditures, 1959 through 1989 filtered educational expenditures were correlated against 1961 through 1991 filtered public assistance expenditures, etc. (see Table 1, Table 3, and Figure 1).

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Presentation of Data

Since the purpose of the study was to determine if there was any significant relationship between federal expenditures for primary and secondary education and federal expenditures for public assistance and since the study examined data over a 33 year period, it was necessary to eliminate the effects of several extraneous variables not related to either of the public functions being correlated. As illustrated by Table 4, Table 5, Figure 2, and Figure 3 the extraneous variables had a large effect on the expenditures for both. Public assistance expenditures, prior to the adjustment for extraneous variables, ranged from a low of $2.4 billion in 1959 to a high of $122.1 billion in 1991. After adjustment, the filtered public assistance expenditures ranged from a low of $1.6 billion in 1989 to a high of $5.0 billion in 1972 (see Figure 4). Unadjusted federal expenditures for primary and secondary education ranged from a low of $415 million in 1959 to a high of $10.9 billion in 1991. After adjustment, the filtered educational expenditures ranged from a low of $415 million in 1959 to a high of $1.9 billion in 1967 (see Figure 4).

The extraneous variable having the largest effect (52.0 percent) on the total federal expenditures for public assistance was changes in the benefits received per recipient. The second largest effect (32.5 percent) was due to inflation. Population growth accounted for the final 15.6 percent of the difference between total public assistance expenditures and filtered public assistance expenditures (see Table 7).

The extraneous variable having the largest effect (62.1 percent) on the total federal expenditures for public primary and secondary education was inflation. Population growth accounted for the second largest effect (23.6 percent). Changes in the student mix portion of the population accounted for the final 14.4 percent of the difference between total educational expenditures and filtered educational expenditures (see Table 7).

The coefficient of correlation between filtered educational expenditures and filtered public assistance expenditures changed with each one year shift in the filtered public assistance expenditures in relation to the filtered educational expenditures (see Table 2 and Figure 1).

Table 2 Correlations of Time Shifted Filtered Public Assistance Expenditures with Filtered Educational Expenditures

Years Shifted	Correlation
0	0.354
1	0.308
2	0.246
3	0.186
4	0.084
5	-0.085
6	-0.278
7	-0.464
8	-0.627
9	-0.760
10	-0.849
11	-0.900
12	-0.907
13	-0.901
14	-0.900
15	-0.894

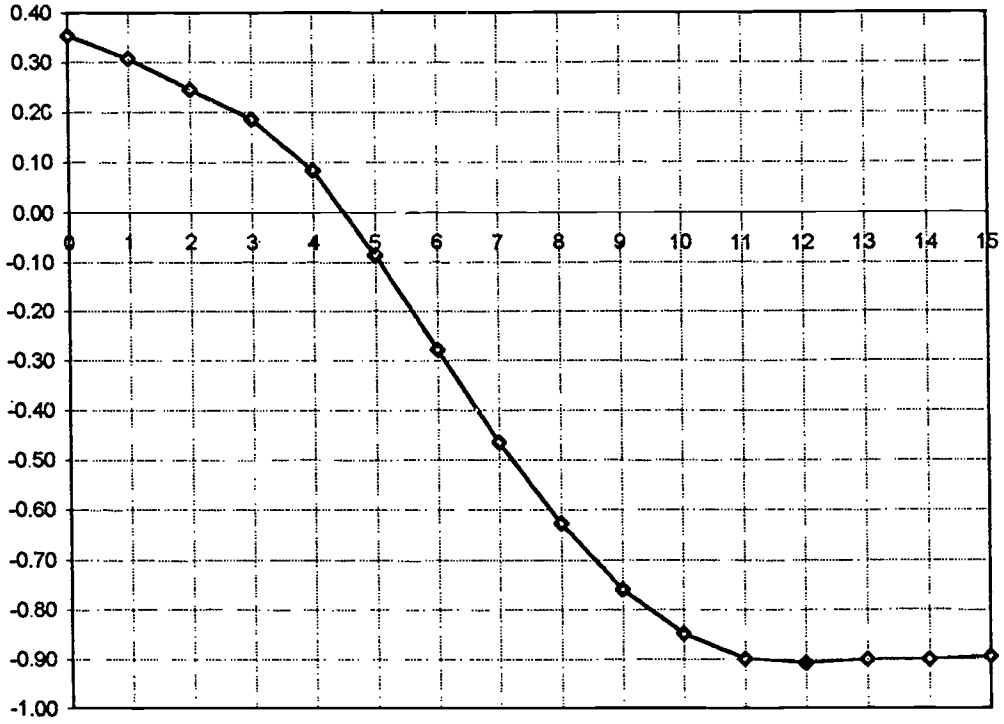

Figure 1 Correlations of Time Shifted Filtered Federal Public Assistance Expenditures with Filtered Federal Educational Expenditures

Analysis of Data

Before elimination of extraneous variables, both educational and public assistance expenditures continued to increase over time. The elimination of the extraneous variables considerably changed this picture (see Figures 2 and 3). The filtered expenditures for public assistance grew moderately until 1972 and have declined every year since then. The filtered expenditures for education grew moderately until 1966. In 1966 there was a large increase in filtered educational expenditures primarily due to ESEA. Since 1966 there has

been a moderate decline in filtered educational expenditures. The implication is that the large increase in educational expenditures has resulted in a decrease in the need for public assistance. A correlation analysis cannot prove the causal relationship. However, a significant correlation can be used to predict future public assistance needs on the basis of changes in educational expenditures.

Children attend primary and secondary schools for 12 years. It is reasonable to believe that if there is a cause and effect relationship between educational expenditures and public assistance needs, the correlation might take up to 12 years to manifest itself. The initial correlation of the data without considering any time shift did not indicate a significant relationship ($r=.354$). The correlation of the data indicated a significant relationship ($r>-.60$) when public assistance expenditures were shifted 8 years in relation to educational expenditures. The correlation continued to gain significance until the 12th year ($r=-.907$). For the remainder of the time shifts, 13 through 15 years, the correlation remained relatively stable. The correlations of the data from the 8th through the 15th years allows the rejection of the null hypothesis. Therefore, there is a significant relationship between federal primary and secondary educational expenditures and federal public assistance expenditures.

The relationship between filtered public assistance expenditures and filtered educational expenditures can be estimated by plotting the 12 year shifted public assistance expenditures for the period 1971 through 1991 against the educational expenditures for the period 1959 through 1979. The linear regression calculated from this plot indicates that a $1 increase or decrease in educational expenditures will result in a corresponding $1.82 decrease or increase in public assistance expenditures (see Figure 5).

CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

Federal primary and secondary educational expenditures, federal public assistance expenditures, the number of public assistance recipients, the enrollment in public primary and secondary schools, and annual inflation rates for the period 1959 through 1991 were obtained from publicly available reports of several federal agencies. Indices were developed so that the educational and public assistance expenditures could be deflated to remove the effects of the extraneous variables -- population changes, inflation, benefits per recipient changes, and student enrollment changes. The filtered public assistance expenditures were correlated against the filtered educational expenditures. The public assistance expenditures were shifted in relation to the educational expenditures to correlate any delayed response to the educational expenditures. The correlation became significant ($r=-.627$) in the 8th year and continued to gain significance until the 12th year ($r=-.907$). For the 13th to 15th year time shifts the correlation remained relatively constant at around $r=-.9$. Although a significant correlation does not indicate a causal relationship, it does mean that future public assistance expenditures can be estimated by examining current educational expenditures. A linear regression of filtered public assistance expenditures shifted 12 years in relation to filtered educational expenditures indicated an inverse relationship of $1.82 of public assistance expenditures to each $1.00 of educational expenditures.

Conclusion

The null hypothesis that there is no significant relationship between federal expenditures for primary and secondary education and federal expenditures for public assistance must be rejected on the basis of a 12 year time delayed correlation of r=-.907.

Recommendations

Recommendations for replication of this study or for further study on the relationship of expenditures for primary and secondary education and public assistance payments include the following:

1. Verification of the validity of the indices used to deflate the expenditure.

2. Verification of the validity of the findings related to federal expenditures by replicating the study utilizing state level statistics from a random sample of individual states.

3. Extend the study to examine the expenditure of state funds for education and public assistance

Recommendations for further study of the effectiveness of educational expenditures would include the following:

1. Correlate the relationship between expenditures for adult remedial education programs and job training programs to public assistance programs.

2. Correlate the relationship between educational expenditures and the number of burglaries.

3. Correlate the relationship between educational expenditures and the average annual income of a U.S. citizen.

NOTES

[1] Savage, David G. "Why Chapter 1 Hasn't Made Much Difference." Phi Delta Kappan 68 no. 8 (April 1987): 581-584.

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[4] Coalition on Human Needs. How The Poor Would Remedy Poverty. Washington, D.C., 1987.

[5] Schultz, 30-31.

[6] Coalition on Human Needs, 24-25.

[7] Savage, 581-584.

[8] Coalition of Human Needs, 26-40.

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[10] Coalition of Human Needs, 3.

[11] Taylor and Chatters, 440.

[12] Schweinhart, Lawrence and Jeffrey J. Koshel and Anne Bridgeman. "Policy Options for Preschool Programs." Phi Delta Kappan 68 no. 7 (March 1987): 524-529.

[13] Smith, Lee. "A Welfare Cure That Works." Fortune 11 July 1994, 14.

[14] U.S. Department of Commerce. Statistical Abstract of the U.S. 1962 through 1994. Washington: GPO, 1962 - 1994.

[15] U.S. Department of Health and Welfare. Social Security Administration. Social Security Bulletin : Annual Statistical Supplement 1966 to 1994. Washington: GPO, 1966-1994.

[16] U.S. Department of Education. National Center for Educational Statistics. Digest of Education 1965 through 1994. Washington: GPO, 1965 - 1994.

Appendix A

Tables

Table 3 Indices

	Annual	Compound	Inflation	Population		Student		A.F.D.C.			Pub. Asst.
Year	Inflation	Inflation	Index	Population	Index	Population	Index	Benefits	Recipients	Benefits/Recipient	Index
	%	Factor	1959 Base	Thousands	1959 Base	Thousands	1959 Base	$ Millions	Thousands	$/Year	1959 Base
1959	1.50%	1.0075	1.0000	177,830	1.0000	36087	1.0000	1975	2946	670.40	1.0000
1960	1.70%	1.0246	1.0170	180,671	1.0160	37260	1.0325	2177	3073	708.43	1.0567
1961	1.00%	1.0349	1.0272	183,691	1.0330	38253	1.0600	2334	3566	654.51	0.9763
1962	1.00%	1.0452	1.0374	186,538	1.0490	39470	1.0937	2727	3789	719.71	1.0736
1963	1.30%	1.0588	1.0509	189,242	1.0642	40749	1.1292	2979	3930	758.02	1.1307
1964	1.30%	1.0726	1.0646	191,889	1.0791	41416	1.1477	3161	4219	749.23	1.1176
1965	1.60%	1.0897	1.0816	194,303	1.0926	42173	1.1686	3488	4396	793.45	1.1835
1966	2.90%	1.1231	1.1148	196,560	1.1053	43039	1.1926	4366	4666	935.71	1.3957
1967	3.10%	1.1561	1.1475	198,712	1.1174	43891	1.2163	5260	5309	990.77	1.4779
1968	4.20%	1.2047	1.1957	200,706	1.1286	44944	1.2454	6455	6086	1060.63	1.5821
1969	5.50%	1.2709	1.2614	202,677	1.1397	45550	1.2622	7608	7313	1040.34	1.5518
1970	5.70%	1.3434	1.3334	205,052	1.1531	45894	1.2718	9649	9659	998.96	1.4901
1971	4.40%	1.4025	1.3921	207,661	1.1678	46071	1.2767	12990	10653	1219.37	1.8189
1972	3.20%	1.4473	1.4365	209,896	1.1803	45726	1.2671	16291	11069	1471.77	2.1954
1973	6.20%	1.5371	1.5257	211,909	1.1916	45444	1.2593	18015	10815	1665.74	2.4847
1974	11.00%	1.7062	1.6935	213,854	1.2026	45073	1.2490	18169	11022	1648.43	2.4589
1975	9.10%	1.8614	1.8475	215,973	1.2145	44819	1.2420	22406	11404	1964.75	2.9307
1976	5.80%	1.9694	1.9547	218,035	1.2261	44311	1.2279	27485	11203	2453.36	3.6595
1977	6.50%	2.0974	2.0818	220,239	1.2385	43577	1.2076	30126	10780	2794.62	4.1686
1978	7.30%	2.2505	2.2337	222,585	1.2517	42551	1.1791	34440	10349	3327.86	4.9640
1979	11.30%	2.5048	2.4862	225,055	1.2656	41651	1.1542	37125	10379	3576.93	5.3355
1980	13.50%	2.8429	2.8217	227,726	1.2806	40877	1.1327	42226	11101	3803.80	5.6739
1981	10.30%	3.1358	3.1125	229,966	1.2932	40044	1.1097	48709	10613	4589.56	6.8460
1982	6.10%	3.3271	3.3023	232,188	1.3057	39566	1.0964	44823	10504	4267.23	6.3652
1983	3.20%	3.4335	3.4079	234,307	1.3176	39252	1.0877	47212	10865	4345.33	6.4817
1984	4.30%	3.5812	3.5545	236,348	1.3291	39208	1.0865	49386	10740	4598.32	6.8591
1985	3.50%	3.7065	3.6789	238,466	1.3410	39422	1.0924	52320	10924	4789.45	7.1442
1986	1.90%	3.7769	3.7488	240,651	1.3533	39753	1.1016	55299	11065	4997.65	7.4547
1987	3.70%	3.9167	3.8875	242,804	1.3654	40008	1.1087	58433	10882	5369.69	8.0097
1988	4.10%	4.0773	4.0469	245,021	1.3778	40189	1.1137	62463	10898	5731.60	8.5495
1989	4.80%	4.2730	4.2412	247,342	1.3909	40543	1.1235	69293	11183	6196.28	9.2427
1990	5.40%	4.5037	4.4702	249,908	1.4053	41217	1.1422	79233	12159	6516.41	9.7202
1991	4.20%	4.6929	4.6580	252,648	1.4207	42000	1.1639	97339	13489	7216.18	10.7640

Table 4 Federal Expenditures for Public Assistance

	(1)	Population	(2)	Pub. Asst.	(3)	Inflation	(4)
Year	Pub. Asst.	Index	Pub. Asst.	Index	Pub. Asst.	Index	Pub. Asst.
	($ Millions)	1959 Base	$ Millions	1959 Base	($ Millions)	1959 $	$ Millions
1959	2379	1.0000	2379	1.0000	2379	1.0000	2379
1960	2628	1.0160	2587	1.0567	2448	1.0170	2407
1961	2802	1.0330	2713	0.9763	2778	1.0272	2705
1962	3170	1.0490	3022	1.0736	2815	1.0374	2713
1963	3558	1.0642	3343	1.1307	2957	1.0509	2814
1964	3777	1.0791	3500	1.1176	3132	1.0646	2942
1965	4227	1.0926	3869	1.1835	3269	1.0816	3022
1966	5032	1.1053	4553	1.3957	3262	1.1148	2926
1967	5982	1.1174	5353	1.4779	3622	1.1475	3157
1968	7323	1.1286	6488	1.5821	4101	1.1957	3430
1969	8621	1.1397	7564	1.5518	4874	1.2614	3864
1970	10942	1.1531	9489	1.4901	6368	1.3334	4776
1971	14850	1.1678	12717	1.8189	6992	1.3921	5022
1972	18706	1.1803	15848	2.1954	7219	1.4365	5025
1973	21174	1.1916	17769	2.4847	7151	1.5257	4687
1974	21792	1.2026	18121	2.4589	7370	1.6935	4352
1975	27091	1.2145	22306	2.9307	7611	1.8475	4120
1976	32707	1.2261	26676	3.6595	7289	1.9547	3729
1977	36890	1.2385	29786	4.1686	7145	2.0818	3432
1978	42367	1.2517	33848	4.9640	6819	2.2337	3053
1979	46302	1.2656	36586	5.3355	6857	2.4862	2758
1980	53041	1.2806	41419	5.6739	7300	2.8217	2587
1981	58903	1.2932	45549	6.8460	6653	3.1125	2138
1982	55607	1.3057	42589	6.3652	6691	3.3023	2026
1983	59398	1.3176	45081	6.4817	6955	3.4079	2041
1984	63883	1.3291	48066	6.8591	7008	3.5545	1971
1985	67814	1.3410	50571	7.1442	7079	3.6789	1924
1986	70051	1.3533	51764	7.4547	6944	3.7488	1852
1987	74593	1.3654	54632	8.0097	6821	3.8875	1755
1988	81425	1.3778	59096	8.5495	6912	4.0469	1708
1989	89674	1.3909	64472	9.2427	6976	4.2412	1645
1990	101315	1.4053	72094	9.7202	7417	4.4702	1659
1991	122133	1.4207	85965	10.7640	7986	4.6580	1715
Mean	**36974**		**28176**		**5794**		**2919**
Slope	**3307**		**2379**		**165**		**-51**

(1) Current Year Expenditures

(2) Deflated for Population Changes

(3) Deflated for Population and Benefit Changes

(4) Deflated for Population, Benefit, and Inflationary Changes

Table 5 Federal Expenditures For Primary and Secondary Public Education

Year	(1) Educational ($ Millions)	Population Index 1959 Base	(2) Educational $ Millions	Student Index 1959 Base	(3) Educational ($ Millions)	Inflation Index 1959 $	(4) Educational $ Millions
1959	415	1.0000	415	1.0000	415	1.0000	415
1960	507	1.0160	499	1.0325	483	1.0170	475
1961	502	1.0330	486	1.0600	458	1.0272	446
1962	554	1.0490	528	1.0937	483	1.0374	465
1963	600	1.0642	564	1.1292	499	1.0509	475
1964	666	1.0791	617	1.1477	538	1.0646	505
1965	892	1.0926	816	1.1686	699	1.0816	646
1966	2411	1.1053	2181	1.1926	1829	1.1148	1641
1967	3038	1.1174	2719	1.2163	2235	1.1475	1948
1968	2967	1.1286	2629	1.2454	2111	1.1957	1765
1969	2838	1.1397	2490	1.2622	1973	1.2614	1564
1970	3212	1.1531	2786	1.2718	2190	1.3334	1643
1971	3724	1.1678	3189	1.2767	2498	1.3921	1794
1972	3857	1.1803	3268	1.2671	2579	1.4365	1795
1973	4088	1.1916	3431	1.2593	2724	1.5257	1786
1974	4140	1.2026	3443	1.2490	2756	1.6935	1628
1975	4884	1.2145	4021	1.2420	3238	1.8475	1753
1976	4679	1.2261	3816	1.2279	3108	1.9547	1590
1977	4965	1.2385	4009	1.2076	3320	2.0818	1595
1978	5707	1.2517	4559	1.1791	3867	2.2337	1731
1979	6714	1.2656	5305	1.1542	4596	2.4862	1849
1980	6629	1.2806	5177	1.1327	4570	2.8217	1620
1981	6769	1.2932	5234	1.1097	4717	3.1125	1516
1982	7598	1.3057	5819	1.0964	5308	3.3023	1607
1983	6935	1.3176	5263	1.0877	4839	3.4079	1420
1984	7635	1.3291	5745	1.0865	5287	3.5545	1487
1985	7297	1.3410	5442	1.0924	4981	3.6789	1354
1986	7426	1.3533	5487	1.1016	4981	3.7488	1329
1987	7555	1.3654	5533	1.1087	4991	3.8875	1284
1988	8098	1.3778	5877	1.1137	5277	4.0469	1304
1989	8869	1.3909	6376	1.1235	5676	4.2412	1338
1990	9681	1.4053	6889	1.1422	6031	4.4702	1349
1991	10865	1.4207	7647	1.1639	6571	4.6580	1411
Mean	**4558**		**3582**		**3102**		**1347**
Slope	**305**		**214**		**194**		**24**

(1) Current Year Expenditures

(2) Deflated for Population Changes

(3) Deflated for Population and Student Enrollment Changes

(4) Deflated for Population, Student Enrollment, and Inflationary Changes

Table 6 Correlation Studies with Time Shifts

Eductional		Pub. Assist.		*($ Millions)														
Year	*	Year	*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1959	415	1959	2379	2407	2705	2713	2814	2942	3022	2926	3157	3430	3864	4776	5022	5025	4687	4352
1960	475	1960	2407	2705	2713	2814	2942	3022	2926	3157	3430	3864	4776	5022	5025	4687	4352	4120
1961	446	1961	2705	2713	2814	2942	3022	2926	3157	3430	3864	4776	5022	5025	4687	4352	4120	3729
1962	465	1962	2713	2814	2942	3022	2926	3157	3430	3864	4776	5022	5025	4687	4352	4120	3729	3432
1963	475	1963	2814	2942	3022	2926	3157	3430	3864	4776	5022	5025	4687	4352	4120	3729	3432	3053
1964	505	1964	2942	3022	2926	3157	3430	3864	4776	5022	5025	4687	4352	4120	3729	3432	3053	2758
1965	646	1965	3022	2926	3157	3430	3864	4776	5022	5025	4687	4352	4120	3729	3432	3053	2758	2587
1966	1641	1966	2926	3157	3430	3864	4776	5022	5025	4687	4352	4120	3729	3432	3053	2758	2587	2138
1967	1948	1967	3157	3430	3864	4776	5022	5025	4687	4352	4120	3729	3432	3053	2758	2587	2138	2026
1968	1765	1968	3430	3864	4776	5022	5025	4687	4352	4120	3729	3432	3053	2758	2587	2138	2026	2041
1969	1564	1969	3864	4776	5022	5025	4687	4352	4120	3729	3432	3053	2758	2587	2138	2026	2041	1971
1970	1643	1970	4776	5022	5025	4687	4352	4120	3729	3432	3053	2758	2587	2138	2026	2041	1971	1924
1971	1794	1971	5022	5025	4687	4352	4120	3729	3432	3053	2758	2587	2138	2026	2041	1971	1924	1852
1972	1795	1972	5025	4687	4352	4120	3729	3432	3053	2758	2587	2138	2026	2041	1971	1924	1852	1755
1973	1786	1973	4687	4352	4120	3729	3432	3053	2758	2587	2138	2026	2041	1971	1924	1852	1755	1708
1974	1628	1974	4352	4120	3729	3432	3053	2758	2587	2138	2026	2041	1971	1924	1852	1755	1708	1645
1975	1753	1975	4120	3729	3432	3053	2758	2587	2138	2026	2041	1971	1924	1852	1755	1708	1645	1659
1976	1590	1976	3729	3432	3053	2758	2587	2138	2026	2041	1971	1924	1852	1755	1708	1645	1659	1715
1977	1595	1977	3432	3053	2758	2587	2138	2026	2041	1971	1924	1852	1755	1708	1645	1659	1715	
1978	1731	1978	3053	2758	2587	2138	2026	2041	1971	1924	1852	1755	1708	1645	1659	1715		
1979	1849	1979	2758	2587	2138	2026	2041	1971	1924	1852	1755	1708	1645	1659	1715			
1980	1620	1980	2587	2138	2026	2041	1971	1924	1852	1755	1708	1645	1659	1715				
1981	1516	1981	2138	2026	2041	1971	1924	1852	1755	1708	1645	1659	1715					
1982	1607	1982	2026	2041	1971	1924	1852	1755	1708	1645	1659	1715						
1983	1420	1983	2041	1971	1924	1852	1755	1708	1645	1659	1715							
1984	1487	1984	1971	1924	1852	1755	1708	1645	1659	1715								
1985	1354	1985	1924	1852	1755	1708	1645	1659	1715									
1986	1329	1986	1852	1755	1708	1645	1659	1715										
1987	1284	1987	1755	1708	1645	1659	1715											
1988	1304	1988	1708	1645	1659	1715												
1989	1338	1989	1645	1659	1715													
1990	1349	1990	1659	1715														
1991	1411	1991	1715															
Correlation			**0.354**	**0.308**	**0.246**	**0.186**	**0.084**	**-0.085**	**-0.278**	**-0.464**	**-0.627**	**-0.760**	**-0.849**	**-0.900**	**-0.907**	**-0.901**	**-0.900**	**-0.894**

Table 7 Analysis of Extraneous Variables

Description	$ millions	Gross Percentage	Relative Percentage
Public Assistance Expenditures		*	*
Mean of public assistance expenditures	3307		
Mean deflated for population	2379		
Effect of population changes	927	28.0%	11.1%
Mean deflated for population	2379		
Mean deflated for population and benefit changes	165		
Effect of benefit changes	2214	93.1%	36.9%
Mean deflated for population and benefit changes	165		
Mean deflated for population, benefits, and inflationary changes	-51		
Effect of Inflationary Changes	216	130.8%	51.9%
Total effect of all variables	3358	251.9%	100.0%
Educational Expenditures			
Mean of educational expenditures	305		
Mean deflated for population	214		
Effect of population changes	91	29.9%	23.5%
Mean deflated for population	214		
Mean deflated for population and student enrollment changes	194		
Effect of student enrollment changes	20	9.5%	7.5%
Mean deflated for population and student enrollment changes	194		
Mean deflated for pop., student enrollment, and inflationary changes	24		
Effect of Inflationary Changes	170	87.8%	69.0%
Total effect of all variables	281	127.2%	100.0%
* The gross percentage change represents the change for each level of the calculations and thus includes a covariance effect of all previous deflations. The relative percentage accurately represents the effect of of each variable on the unadjusted total expenditures.			

Appendix B

Figures

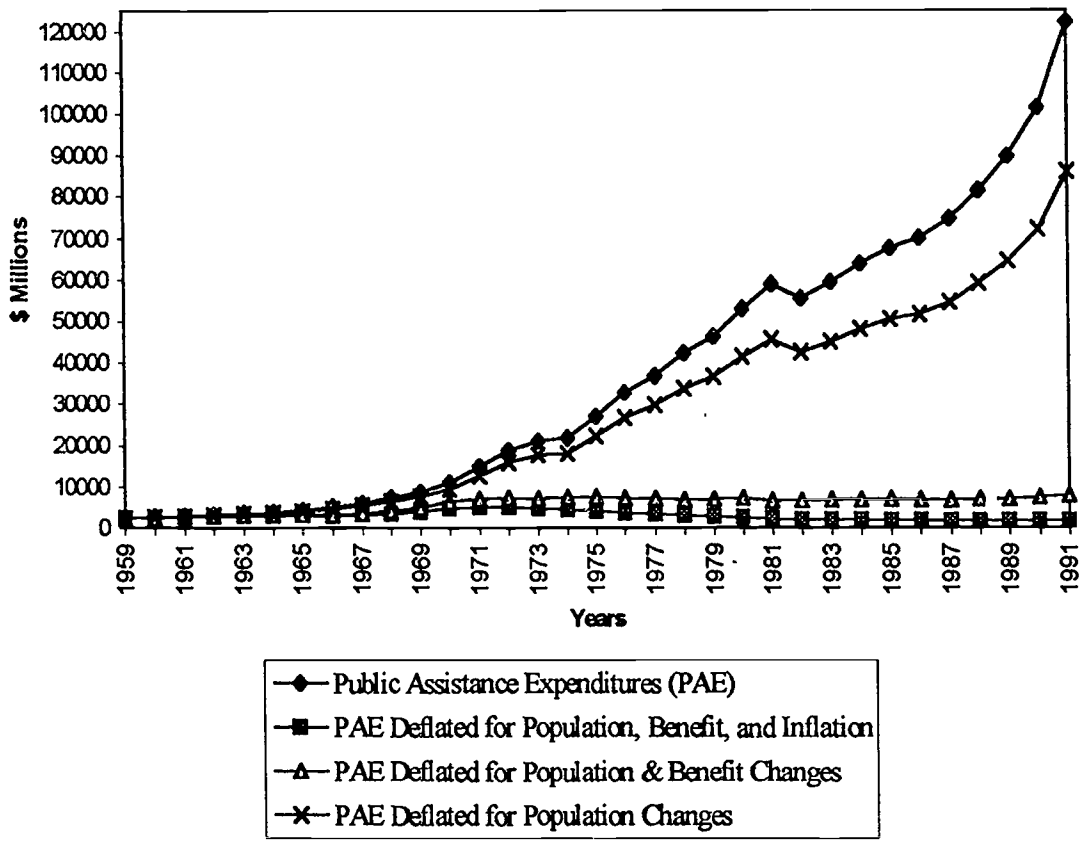


Figure 2 Federal Public Assistance Figures

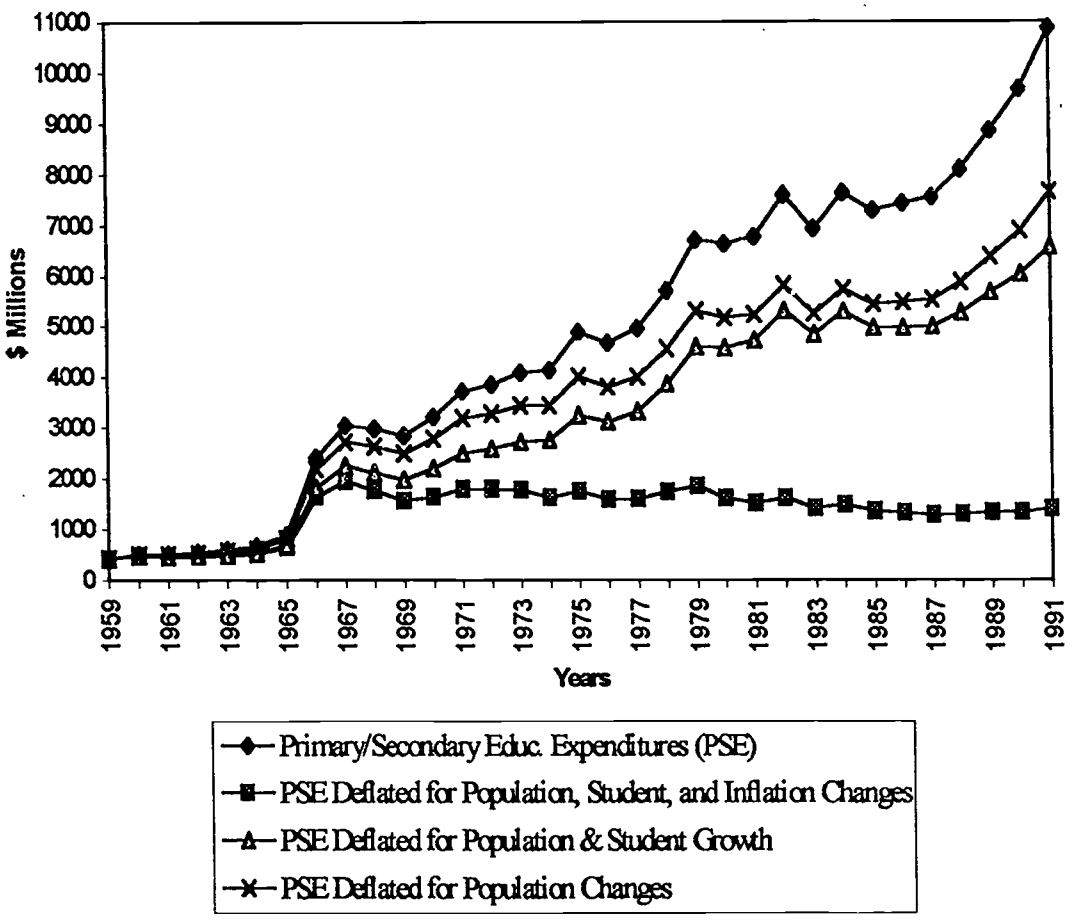
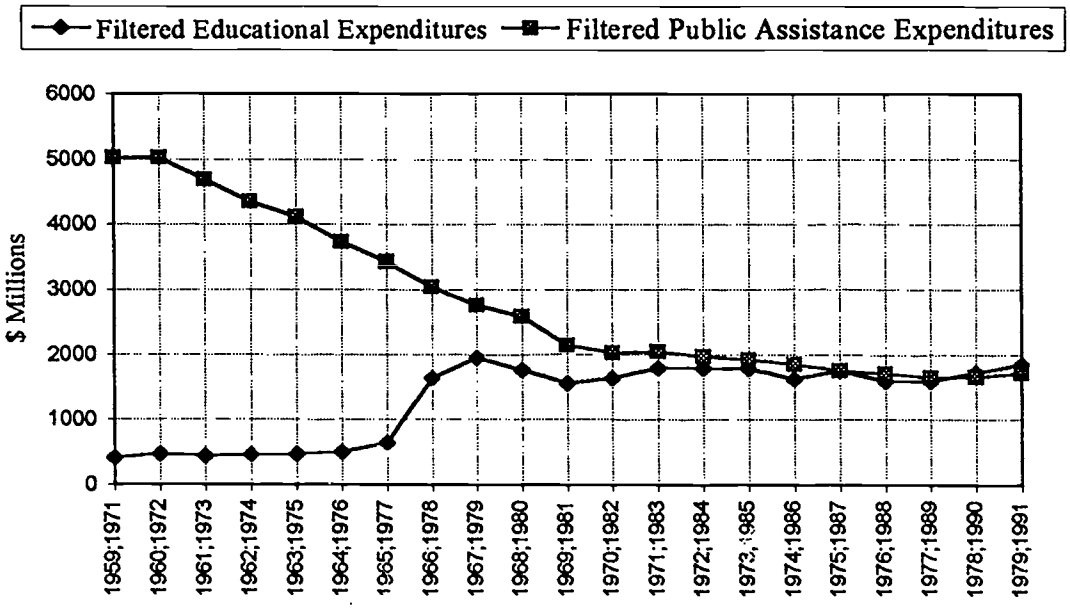


Figure 3 Federal Primary and Secondary Public Educational Expenditures



Public Assistance1971 to 1991
Education 1959 to 1979

Figure 4 Filtered Federal Educational and Filtered Public Assistance Expenditures With a 12 Year Time Shift

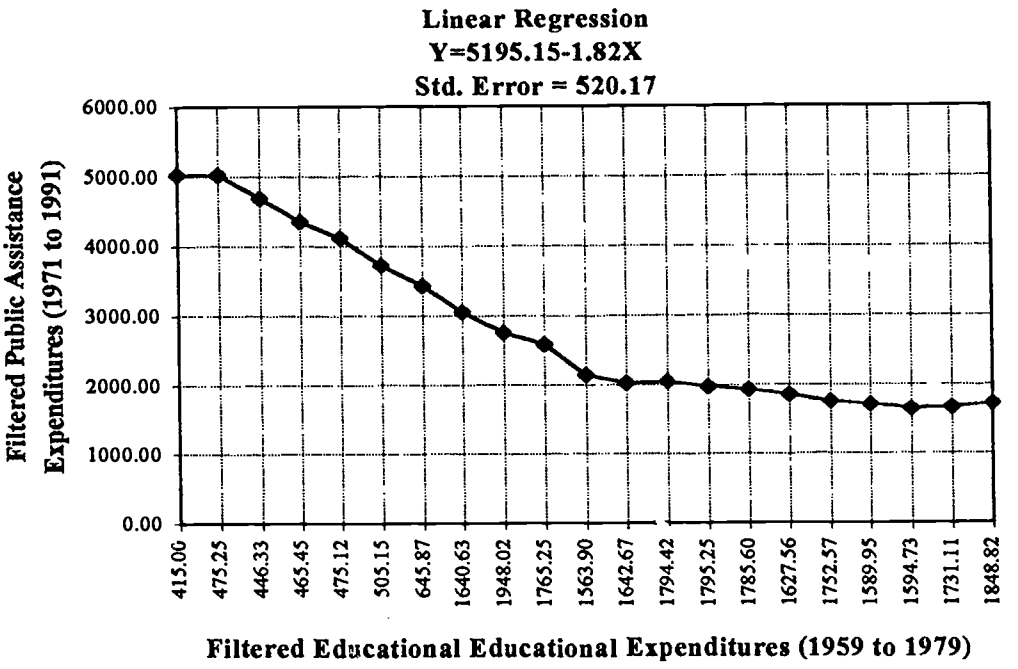


Figure 5 Filtered Public Assistance Expenditures as a Function of Filtered Educational Expenditures

ABSTRACT

THE RELATIONSHIP OF FEDERAL EDUCATIONAL EXPENDITURES AND FEDERAL PUBLIC ASSISTANCE EXPENDITURES

by Charles F. Presley

The purpose of this study was to determine if there is a significant relationship between federal expenditures for education and federal expenditures for public assistance. Federal primary and secondary educational expenditures, federal public assistance expenditures, the number of public assistance recipients, the enrollment in public primary and secondary schools, and annual inflation rates for the period 1959 through 1991 were obtained from publicly available reports of several federal agencies. Indices were developed so that the educational and public assistance expenditures could be deflated to remove the effects of the extraneous variables -- population changes, inflation, benefits per recipient changes, and student enrollment changes. To allow for a delayed reaction, the deflated public assistance expenditures were shifted year by year and correlated with the deflated educational expenditures. When the public assistance expenditures were shifted 12 years in relation to the educational expenditures there was a significant correlation of $r=-.907$. A linear regression of filtered public assistance expenditures shifted 12 years in relation to filtered educational expenditures indicated an inverse relationship of \$1.82 of public assistance expenditures to each \$1.00 of educational expenditures.