

Exhibit 39



Teacher Supply and Demand in Arkansas

August, 2006

BUREAU OF LEGISLATIVE RESEARCH

315 State Capitol Little Rock, Arkansas 72201 (501) 682-1937 www.arkleg.state.ar.us

TABLE OF CONTENTS

Introduction	1
Summaries of Teacher Supply and Demand Studies in the United States	2
Summaries of Teacher Supply and Demand Studies in Other States	4
Summaries of Recent Education Legislation in the SREB States	7
Findings in Arkansas	10
Conclusions and Implications	17
References	21
Appendices:	24
A -- Determinants of Supply and Demand	
B -- Graphical Representations	
C -- Reported Shortage and Surplus Subject Areas	
D -- The Correlation Matrix	
E -- Regression Results	

This report was produced by The Bureau of Legislative Research, Arkansas Legislative Council.
For further information or inquiries contact Richard Wilson at richardw@arkleg.state.ar.us or 682-1937.

Introduction

Shortages of qualified educators exist across the United States. One objective and requirement of the *No Child Left Behind* (NCLB) legislation is to have a highly qualified instructor in every classroom. Currently that is not the case.

Teacher shortages within states and within the nation are generally in specified subject areas or specified districts. In most of the recent research on this subject the conclusion is that there is no comprehensive, universal supply and demand mismatch. Even though teacher retirements are increasing, the current supply of educators is generally sufficient to meet demand. The real problem is attrition (i.e., teachers leaving the profession during the first few years). Thus, the answer to most teacher shortage problems is offered in the form of a question -- how do we retain the qualified teachers that are already trained, certified and in place ?

This research project aims to answer the following questions:

- 1) Does a teacher shortage exist in Arkansas ?**
- 2) If so, what are the reasons ?**
- 3) Is there a risk of a future teacher shortage ?**
- 4) What are the options for proposed solutions ?**

To address these questions, an examination of the recent literature was conducted. Articles were selected based on production date (the most recent seven years) and, in part, location (three of six states contiguous to Arkansas were included). Fourteen teacher supply-and-demand studies from individual states and from the nation were reviewed. Although findings varied, many similarities were observed in "causes" or problems associated with teacher shortages.

The similarities and dissimilarities served as a basis for designing a survey of school districts in Arkansas by the Bureau of Legislative Research. The survey consisted of requests for objective numerical replies, as well as, lists of verbal answers. In addition to a review of the lists and binary (yes or no) answers, statistical analyses were performed utilizing the numeric replies.

Summaries of Teacher Supply and Demand Studies in the United States

American Association for Employment in Education (AAEE, 2002, 2005):

A survey of 1,267 colleges and universities that prepare educators in 64 teaching, administrative and supporting fields found that the strongest factors for increasing demand are early retirement, routine retirement, student enrollment and class size. The strongest factors for decreasing supply were determined to be school violence, working conditions and salaries. (For a list of the determinants of teacher supply and demand, see Appendix A).

These statistical analyses of national data indicated that shortages exist in math, physics and the special education fields. A discovery of particular concern was that approximately 25% of secondary teachers do not have certification in their primary teaching fields.

The region that includes Arkansas (along with Texas, Oklahoma and Louisiana) reported that teacher shortages occur in math, science and bilingual education; however, slight surpluses occurred in physical education and dance.

In an updated study in 2005, the AAEE confirmed the earlier finding that considerable shortages exist in special education fields and math. Slight shortages were discovered in sciences and foreign languages. Slight surpluses were found in elementary education, physical education and social studies, while all other fields were considered balanced.

Education Commission of the States (ECS, 2005):

Included within a digest of current subject-matter research from August, 2005, the general conclusion found was that the problem wasn't the overall supply of teachers, which was and would continue to be, more than adequate to meet demand -- but rather -- imbalances between supply and demand in certain subjects and certain districts, attributable largely to significant numbers of teachers leaving their jobs for reasons other than retirement.

Thus, policy-makers need to change the question from, "how do we find and prepare more teachers" to "how do we get the good teachers we have recruited, trained and hired to stay in their jobs?"

The resolution to the problem could be to create an augmentation in federal leadership to expand the supply of teachers in math, science, bilingual education and special education and, to improve teacher retention rates through the development of common licensing exams and interstate agreements for reciprocity, including a system of pension portability across the states.

Education Resources Information Center (ERIC, 1999):

According to ERIC, among a current estimate of 3.1 million teachers, 2.7 million are in K-12 public schools. Supply growth in the U.S. is projected to be 1.1% annually. In 2008, we will have 3.46 million teachers in public and private schools instructing 54.27 million kids, an average student-teacher ratio of 15.68. NCES (1997) data indicate that 20% of teachers will abandon their profession within the first three years, with 9% leaving the first year. Supply and demand mismatches occur among and within states and districts. Some states produce more teachers than they demand and some states demand more teachers than they produce. The projected demand for teachers on a national scale suggests that supply will need to continue to grow over the next decade.

Center for the Study of Teaching and Policy (Ingersoll, 1999, 2001):

According to the Ingersoll study, school staffing problems are not primarily due to an insufficient supply of teachers; the problem is excess demand created by large numbers of teachers leaving their jobs for reasons other than retirement. The overall amount of turnover accounted for by retirement is relatively minor compared to that resulting from other causes; low salaries, student discipline problems, inadequate support from school administration and limited faculty input into school decision-making are the major factors cited. He concludes by stating that since we don't need to increase overall supply, we need to decrease demand for new teachers by decreasing teacher turnover because at this point in time, "...it's like pouring water into a leaking bucket."

Summaries of Teacher Supply and Demand Studies in Other States

Public Policy Institute of California (California, 2006):

Public schools in California report a shortage of fully credentialed teachers. As with most states, teacher retention is a problem and the focus of a new objective. Within the first two years, 13% of new teachers in California left public schools. By the end of the fourth year 22% had quit teaching. Teachers that were certified in multiple subjects were found to exit less often than teachers certified in a single subject. Among newly hired teachers, 25% are not fully credentialed. The evidence suggests that teachers who stay in public schools over the long term tend to become fully credentialed, thus a positive correlation exists between retention rates and the credentialing process. During the 1990s, California discovered that professional development programs improved teacher retention by 26% with a cost of approximately \$3,370 per participant. In contrast, a starting salary increase of \$4,400 in the same period reduced the probability of new teacher departures by 17%. It was found that although compensation clearly remained a factor in teacher retention, the relatively lower cost of professional development programs is a consideration for fiscally responsible districts.

Mid-Continent Research for Education and Learning (Colorado, 2003):

In this study, Colorado reported that no crisis in teacher demand and supply was found. It was noted that while Colorado trains only half of the teachers employed, the state is a beneficiary of teachers moving in from other states despite the fact that salaries are considered lower than the average salaries from those other states. Two areas of concern were found: a slight shortage in foreign language teachers and the expected aging of their workforce and the associated increase in retirements.

Howard & Stefanie (Idaho, 2005):

A recent study from Idaho reflects that the economy there has prevented the state from raising teacher salaries to a competitive level with neighboring states. Even though the Idaho student population growth appeared to be leveling off, the combination of an aging teacher workforce, expected retirements, new federal NCLB requirements and added state requirements unique to Idaho may create future teacher shortages. One area of major concern was a shortage of teachers in special education fields.

Illinois State Board of Education (Illinois, 2005):

The Illinois State Board of Education creates an annual report to the Governor each year that addresses the supply and demand for educators. In the report from December, 2005, supply-side indicators all presented good news:

- Retention rates are higher than expected,
- the number of certificates issued over the last five years has increased,
- the number of teacher re-entries is increasing, and,
- the number of education students in the pipeline is also increasing.

Regarding the demand-side indicators, the only concern in Illinois is that the K-12 student population continues to increase in the secondary levels and decline in the elementary grades.

Oklahoma State Regents for Higher Education (Oklahoma, 2002):

An Oklahoma teacher supply and demand study from 2002 reported that there was no shortage in the production of teachers but retention is a problem. Areas of present major concern were special education, foreign languages and early childhood. Future concerns include counselors, science, math, librarians and vocational education. Oklahoma teacher salaries were found to rank near last among states in 2000 at 71% of the national average.

Data and Decision Analysis, Inc. & SREB (Tennessee, 2003):

The teacher supply and demand study from 2003 in Tennessee reflects that teacher retention is the priority factor in maintaining an adequate supply of educators. While this study is a detailed investigation into the specific statistics of each school district, the general conclusions suggest that most teachers who leave the profession do not return. The likelihood that teachers who quit will return to the profession is greatest within one year after they leave; the longer they are out of education, the less likely they are to return to teaching. Although approximately 25% of former educators (including retirees) return to teaching jobs in Tennessee, attrition rates were found to be increasing through the progression of the 1990s. The supply of teachers varies greatly across the state, with urban districts reporting the greatest overall shortages. The subject-area needs are similar to other states including secondary math and science.

Institute for School-University Partnership, Texas A&M (Texas, 2001):

A 2001 survey of all (1039) state school districts reflects that districts actually employed 97% of the teachers they needed. However, only 75% of those teachers hired in 2001 were fully certified in the subject areas where needed. Specific shortages existed in elementary ESL and special education, as well as the usual secondary subject-area shortages of math, science and foreign languages. As a result of the study, the university system designed a five-year plan to increase the production of teachers.

Escalante & Eastmond, University of Utah (Utah, 2005):

A recent study in Utah concluded that the state should consider financial incentives to recruit more teachers and perhaps, alternative licensure to retain teachers. In addition to increasing attrition and an aging workforce, growth trends in student population suggest that Utah will face a large shortage of teachers in ten years. As reported in other research, elementary special education and secondary math and science were among the subject-area shortage concerns.

Mid-Continent Research for Education and Learning (Wyoming, 2002):

A study conducted in 2002 for the State of Wyoming suggests that even though the teacher workforce is aging and retirement is on the increase, student population is on the decrease. The unique geographical features of Wyoming also tend to create difficulties toward accessing institutions of higher education. While teacher salaries were found to be above average compared to neighboring states, teacher attrition is increasing. However, the decline in expected student population provides an opportunity to maintain low student-teacher ratios and create flexibilities in future education funding toward teacher quality.

Summaries of Recent Education Legislation in the SREB States (SREB, *Legislative Reports*):

As a result of the consistent findings that retention is the primary problem underlying the teacher supply-and-demand mismatch, a review of the recent legislation in the Southern Regional Education Board (SREB) states was conducted in order to provide a quick-reference guide regarding teacher salaries, professional development, teacher mentors, recruiting or retention incentives and re-entry incentives. Each state's progression or activity within their most recent legislative session is represented below in concise reports:

Arkansas

After providing an additional \$35 million toward public school employee health insurance premiums during the 2005 regular session, Arkansas lawmakers returned for a special session in 2006 and increased the injection for the retirement benefit from 13% to 14%, an additional \$42 per ADM. In addition, the legislature provided increases in foundation funding of 1.6% (2006) and 2.4% (2007) and required districts to correspondingly increase minimum teacher salaries where necessary (82 districts the first year and 39 the second year) to meet the new standards. Also included was legislation providing additional funding earmarked for professional development.

Alabama

Teacher raises of 5% (2007), plus an additional 2.75% for added instructional days, earmarked funding for math, science and reading, and continued funding earmarked for NBPTS certification.

Delaware

Provided teacher pay increases of 2% to 3%.

Florida

Pay increases are derived through collective bargaining. Earmarked funds were made available for professional development and critical shortage areas.

Georgia

In order to cover increasing health insurance premiums, teachers receive a 4% pay increase in 2007, with about half of the teachers also eligible for 3% longevity raises.

Kentucky

Teachers will receive 2% raises in 2007 and an additional \$3000 in 2008 to compensate for additional instructional days and health insurance premiums. Professional development received level funding.

Louisiana

Teachers in most districts are to receive pay increases of 1% to 2% while a few districts will receive the same level of funding due to declining enrollments and changes in local funds.

Maryland

No funds are specifically earmarked for teacher raises, which are determined through collective bargaining. Earmarked funds were made available for NBPTS certifications and signing bonuses for top graduates and working in low-performing schools.

Mississippi

No funds made available for teacher pay increases in 2007; the state recently completed a five-year plan to significantly raise teacher pay. However, additional compensation is made available for teachers in subject or geographic shortage areas. In addition, the state now permits out-of-state teachers who are identified as "highly qualified" according to federal standards to qualify for a Mississippi teaching license.

North Carolina

The session began on May 9, 2006 and the Governor has many proposals reflecting increased funding for K-12, including 8% teacher pay increases over the next biennium.

Oklahoma

A budget has not yet been adopted and is expected in the Summer special session. This will be the third year (2007) of a five-step plan for Oklahoma to increase teacher salaries to the average of surrounding states.

South Carolina

Teachers will receive salary increases sufficient to keep the average at approximately \$300 above the southeastern regional average.

Tennessee

In 2007, teachers will receive raises of 2% and average bonuses of 1%. Lottery funds are to be used to support scholarships to teachers who pursue a graduate degree and certification in math or science, and who then teach those subjects.

Texas

The special session in Texas funded a \$2,000 raise in teacher pay in 2007 and rolls the current \$500 stipend to cover health care costs into the salary schedule. Earmarked funds are also set aside to expand rewards for top-performing teachers in low-performing schools.

Virginia

The legislature has yet to reach agreement on a budget.

West Virginia

No pay increases for 2007 due to a recent special session that allowed increases of \$1,350 (approximately 3.5%). Earmarked funding was set aside for teacher mentors and NBPTS certification.

Findings in Arkansas

The Southern Regional Education Board (SREB) released its Arkansas teacher supply-and-demand study in September of 1995. In addition to the usual approach, this study includes much demographic analysis (i.e., how the workforce is composed regarding race, age and gender).

The highlights reflect that in Arkansas approximately 92% to 94% of teachers return from the previous year. Thus, Arkansas enjoys a relatively stable teacher workforce because other educator studies have reflected that the return rate can be expected to be around 87%. Also found was that "around one-third of those who are certified to teach actually become teachers in Arkansas within four years of certification. If they do not become teachers within that time, they are not likely to enter the profession." (SREB, 1995). And finally, the study concluded that Arkansas would enjoy teacher surpluses in all areas except foreign language for the next decade.

Previous research within the state of Arkansas has produced similar results. In a June, 2000 memo created at the Arkansas Department of Education, the administration research staff warned against utilizing predicted ADM as a driver for teacher demand. To do so would be to ignore attrition which was not only reflected as significant but, "two-thirds of the individuals who leave teaching do so for reasons other than retirement." (Greene, 2000). In addition, it was noted that "special education teachers are even more likely to leave the profession before retirement or change their certification to general education." (Greene, 2000).

During 2004, the Office of Education Policy (OEP) at the University of Arkansas published a policy brief titled, "Teacher Shortages in Arkansas." The OEP found that a shortage did not exist due to teacher education programs producing enough quantity each year but rather, any shortage is due to attrition (i.e., losing teachers already in the field). In addition, a "sorting" problem was discovered (OEP, 2004). Sorting refers to the distribution of teachers and is also described as geographic or subject-area shortages (and surpluses). The OEP found that there was a 19% decline in the number of education degrees awarded between 1993 and 2002 and that only 60% of those students receive an Arkansas teaching license.

The U.S. Department of Education divided the 50 states into four groups and placed Arkansas in the group of states that has the least difficulty in hiring teachers. However, because of the "sorting" problem, waivers are sought and granted to allow teachers to teach out of their certified area of expertise. The problematic areas are the expected secondary foreign language, math and science and elementary special education. [Earlier research reveals that these "sorting" mismatch areas have been consistent in recent history. In the school year 1994-95, the special education fields were suffering shortages while the elementary education fields were in considerable surplus (Schaerer, Vickers, Hansing & Harvey, 1996). Interestingly, in Arkansas, there are currently in excess of 6500 teachers holding certification in special education, which suggests that Arkansas does not suffer from a teacher shortage in special education but rather, the state suffers from those same teachers avoiding the special education area and practicing in other education areas (conversation with Beverly Williams, Assistant Commissioner, Licensure and Human Resources, Arkansas Department of Education, July, 2006)].

The OEP concluded that the Nontraditional Licensure Program (which added 504 teachers in school year 2005-06), STAR and the University Assisted Teacher Recruitment and Retention Grant Program are making strides toward the retention and sorting problem. An additional recommendation was to increase teacher salaries to be competitive with surrounding states.

During 2003, *Education Week* published an Arkansas profile discussing teacher shortages and recruitment. Among the usual reasons for geographic and subject-area shortages, they cited "boredom" (lifestyle) as a factor effecting teacher recruitment and retention in the Arkansas Delta school districts. Although it was mentioned that Arkansas lawmakers had made (and are making) good policy choices in improving distribution problems, it was also stated that the lawmakers were ignoring the "elephant in the living room" (*Education Week*, 2003), which was Arkansas' relatively low teacher pay. *Education Week* sited rankings that reflected Arkansas ranked 42nd out of 51 (D.C. and states) in average teacher salary during the 2000-01 school year.

BLR Survey

The Bureau of Legislative Research (BLR) was asked by the Joint Committee on Education to complete "a teacher supply and demand model" for Arkansas. During Spring, 2006, an examination was undertaken of the existing data in the executive agencies of Arkansas state government. Data were requested from the Arkansas Department of Education, the Arkansas Teacher Retirement System and the Arkansas Department of Higher Education. Although these three agencies have made every effort to provide data and be helpful, it was discovered that the information necessary for a traditional "supply and demand model" (from the context of statistics and economics) did not exist.

As reflected in Appendix B, graphical representations of the data that were supplied at that time are provided. After the application of traditional statistical time-series procedures, all data series except one proved to be of little quality regarding predictability of future estimates.

After the review of the literature from other states and of the nation, it was determined that in order to complete the project and facilitate an understanding of the situation within Arkansas, a survey would be designed and distributed to the Arkansas school districts to derive the required data series.

During May and June of 2006, the BLR asked all Arkansas school districts (253 at that time) to complete a survey of 15 questions regarding teacher supply and demand components. Districts returned 194 surveys (for a return rate of 77%) to the BLR staff. The following points reflect the results of the survey as reported by Arkansas school districts:

Teacher Shortage Information

- Out of the 194 surveys returned, 192 reported shortages.
(Appendix C, p. 1)
- Of the 192 who reported shortages, 19 districts have schools on the 2006-2007 STAR Critical Teacher Shortage List (also see, Appendix C, p. 2)
- The remaining 173 school districts reported shortages on the survey, but do not have school representation on the 2006-2007 STAR Critical Teacher Shortage list (see Appendix C, p. 3)
- There were 11 school districts represented on the STAR Critical Shortage list who did not respond to the survey (also see Appendix C, p.3)

The top 5 subject-areas of shortages reported in the 192 responding districts:

- 1) 76.0% Special Education
- 2) 75.5% Math
- 3) 74.0% Science (composite of all categories of science)
- 4) 35.4% Foreign Languages
- 5) 18.2% Music

Teacher Surplus Information

Out of the 194 surveys returned, 163 school districts reported a surplus in at least one area, 22 reported no surplus and 9 left the question blank.

The top 5 subject-areas of surpluses reported in 163 responding districts:

- 1) 81.0% Elementary Education
- 2) 71.8% Health
- 3) 41.7% Physical Education
- 4) 38.0% Social Studies
- 5) 6.1% Coaches

Survey Questions and Statistical Analyses

The districts were asked, in terms of FTE, how many certified personnel were currently employed, whether the correct number needed were employed, how many would need to be added or subtracted next school year and how many would need to be added or subtracted in five years. As previously stated, each district was asked to list subject areas in which they were experiencing a shortage of teachers or certified personnel; each district was also asked to list any teacher surpluses in subject areas. In addition, each district was asked how many teachers they currently had teaching out of their certified area.

The survey asked if the district utilized the available recruiting incentives (i.e., STAR, Act 101, etc). Also asked was the percentage of personnel employed that grew up in, or near, the county where the district is headquartered and also, what is the annual percentage rate of teacher turnover.

If a district is adding teachers to their payroll, we asked them to quantify the teachers needed for each reason, such as, district ADM growth, class-size restrictions, additional course requirements or additional support program requirements.

And finally, each district was asked to estimate the number of expected teacher retirements over the next three years.

With regard to aggregated data, the 194 replies represent a total of over 30,000 FTE teachers. A review of the replies reveals that, within the sample, 535 teachers were teaching out of their certified area and that 1,915 teachers are expected to retire over the next three years.

Based on the responses received, the average district statewide employs 138 teachers (FTE). Two additional teachers will be needed next year and 14 additional teachers will be needed in five years, reflecting a growth rate of approximately 2%, which is confirmation of the time-series trend calculated in CERTIFIEDFTE (see Appendix B). In addition, the average district has three teachers teaching outside of their certified area and 61% of their teachers grew up in, or near, the county in which the district resides. The greatest need to add teachers is caused by district growth and the average district will realize the retirement of 15 teachers over the next three years. Only 31 of the districts that need more teachers replied positively to the question regarding the use of recruiting incentives.

The Correlation Matrix

The correlation matrix reveals the simple statistical relationships among the variables (see Appendix D). The size and nature (positive or negative) of the correlations were in accord with generalizations found in the literature and discussions among practitioners. Relationships with the demand for teachers next year (FTE_{next}) and in five years (FTE_{five}) were statistically significant with the number of teachers teaching out of their certified field (OutCert), the expected retirements (LRTot) and all four of the reasons for need (Needs 1, 2, 3 & 4). Among those schools that are adding teachers next year, the greatest correlation (among the reasons to do so) was associated with district growth (Needs1). The other three reasons which are statistically significant are class-size restrictions (Needs2), additional course requirements (Needs3) and additional support programs (Needs4). Interestingly, in all cases, the correlation coefficients grow in strength as the dependent variables move from one year to five years, indicating increasing need.

The Regression Equation

Regression analyses were conducted to examine how well each variable predicts the need for teachers in the next five years (FTE_{five}) relative to each other. The regression analysis considers all variables simultaneously in examining relationships between variables (or predictors) and the need for teachers. The regression equation (see Appendix E) was constructed using the estimated teacher demand five years hence (FTE_{five}) as the dependent variable. The dependent variable selection was based on the positive marginal strength of the correlation coefficients, which served to reflect an increased need in future years. The independent variables selected for this equation are the additional teachers needed because of district growth (Needs1), the expected teacher retirements over the next three years (LRTot) and the number of teachers now teaching out of their certified area (OutCert).

The results reveal that 95% of the variation in demand is accounted for by these three independent variables. The credibility of these results is supported by the expected logical relationships as discussed in the professional literature and practice arenas. In addition, the equation is descriptive more so than functional. Although dependent variable forecast testing was achieved, the statistical variation within the survey data is relatively large and does not produce forecasts associated with excellent reliability.

Regional Analysis

Statistical analyses were also produced within the data by region. The districts were divided into a total of five regions: Arkansas' four Congressional districts with the Fourth district (due to its geographical size) being divided into East and West sections. Analyses of differences between means (averages) and variances within the five regions revealed that there were no noteworthy differences between regions. Since no large and significant differences were realized, the conclusion was made that the school districts within each region vary to a similar extent as the entire state. In other words, no one region revealed teacher shortage problems that were greatly different from each other or different than the state as a whole.

Conversely, information received from the Arkansas Department of Education indicates that waivers (to teach subjects out of the teacher's certified area) in some of the identifiable shortage subject-areas, are more frequent in the Delta region of the state. This discrepancy is explained by the structure of the survey questionnaire; the questions associated with shortage subject-areas were not requesting numeric answers. The regional statistical analyses were therefore dependent on the cumulative shortage data as reflected in the teacher quantities.

Conclusions & Implications

If Arkansas is experiencing a current supply of teachers that is considered adequate to relieve teacher retirements, a cursory look at the long-term trends suggest that this luxury may not last forever (see Appendix B, Graphical Representations and especially, p. 8). In addition, the "ratio of actives-to-retires" as calculated by the actuaries at the Arkansas Teacher Retirement System, has decreased from 3.2 / 1 in 2002 to 2.25 / 1 in 2007 and expected to continue to decline to reach unitary (one-to-one) status near the year 2030 (conversation with David Malone, Executive Director, ATRS, July, 2006).

Irrespective of those trends, the evidence reveals that a continuing priority problem across the nation and the states is teacher attrition. Even though this study was not able to produce a confident number representative of teacher attrition in Arkansas, practical and deductive reasoning implies it does exist. In fact, of the 192 districts that reported shortages (one or more shortage area), 139 of those districts stated that they currently employ the correct FTE quantity. Therefore, as redundantly discovered in almost all of the current literature and within the Arkansas survey, deficient retention causes geographical and subject area shortages that are of constant concern.

Reflected in the aggregate of the studies* presented herein is observation that the recurring reasons that teachers leave the profession before retirement are:

- 1) low salaries and benefits,
- 2) dissatisfaction with professional prestige,
- 3) family or child-rearing
- 4) lack of administrative support,
- 5) opportunities in other fields, and
- 6) student discipline problems.

* ECS, Oklahoma and Tennessee. In order to provide information useful toward future remedial legislation, a survey of Arkansas teachers that actually left the profession before retirement is a future research project of the BLR.

Because of the overwhelming evidence in economic theory and application that the dominant determinant of commodity supply and demand is price, it logically follows that lawmakers should take every opportunity to review and appropriately adjust teacher pay. In addition, the provision of effective incentives to recruit and retain teachers appears to be increasing in importance and (due to long-term trends of departure between teacher retirement and education graduates), opportunity. Comparative teacher-pay evidence confirms that the Arkansas General Assembly is making progress. Reflected below are the two-year increases in average Arkansas teacher salaries compared to the surrounding states and the nation:

Arkansas and Surrounding States Teacher Salary Averages, 2004 & 2002

<u>State</u>	<u>SY 03-04 Average *</u>	<u>SY 01-02 Average *</u>	<u>Percentage Change</u>
Arkansas	\$39,226	\$36,026	8.88
Louisiana	\$37,123	\$36,328	2.19
Mississippi	\$36,217	\$33,295	8.77
Missouri	\$38,247	\$36,053	6.09
Oklahoma	\$35,061	\$32,870	6.67
Tennessee	\$40,318	\$38,515	4.68
Texas	\$40,597	\$39,230	3.48
Average of Surrounding States	\$37,927	\$36,049	5.21
United States	\$46,597	\$44,327	5.12

Among the 50 states, Arkansas' teacher-pay ranking improved from 45 to 37 during this two-year period. Accordingly, only three states' growth rate in teacher pay outpaced that of Arkansas.*

* American Federation of Teachers, 2005 & 2003 Annual Surveys. School year 2004-05 numbers are not expected to be published until November, 2006, thus, the numbers reflected above do not include the effect of the Adequacy Fund or subsequent legislation and funding.

Utilizing the salaries reflected above, comparable ratios can be derived as follows:

<u>State</u>	<u>SY 03-04</u> <u>Percentage of</u> <u>Surrounding States</u> <u>Average</u>	<u>SY 01-02</u> <u>Percentage of</u> <u>Surrounding States</u> <u>Average</u>
Arkansas	103.43	99.94
Louisiana	97.88	100.77
Mississippi	95.49	92.36
Missouri	100.84	100.01
Oklahoma	92.44	91.18
Tennessee	106.30	106.84
Texas	107.04	108.82
United States	122.86	122.96

In the context of average salaries and average beginning salaries, corroborative results are also reflected in the recent funding analysis report received from Lawrence O. Picus and Associates:

Overall, the average beginning salary in the state improved from \$27,380 in 2003-04 to \$30,070 in 2004-05. This represents an increase of nearly 10 percent. With respect to average salary for the teaching staff, the figure increased from \$39,409 in 2003-04 to \$41,489 in 2004-05, an increase of more than 5 percent. In the state's smallest school districts, average salaries increased by approximately 10 percent; in the poorest districts, average salaries increased by roughly 7 percent. In each case, these gains outpaced those of the statewide average. (Odden, Picus, Ritter & Barnett, 2006)

Therefore, from the school years beginning in late August, 2001 and ending in early June, 2005, Arkansas lawmakers increased average teacher pay by approximately 15.2%.

Clearly, Arkansas lawmakers have recently improved teacher pay. These efforts must continue in order to increase rates of retention. In addition, attention should remain focused on the beginning salaries to ensure that the teaching profession is attractive to college-student candidates. As demonstrated by other states, further advancements in the provision of teacher mentors, practical certification (and multiple certification) processes, a professional work environment and effective professional development will also serve to support the retention of teachers.

When simply considering only the average salary and benefits in place for the upcoming school year (2006-07), the State of Arkansas will have an investment of approximately \$1.8 billion in the K-12 teacher workforce. In the interest of protecting that investment, and as demonstrated by the California study, targeted professional development programs appear to provide an effective hedge. Indeed, Arkansas currently funds \$50 per ADM to districts for professional development expenses. Furthermore, during the recent Special Session, the Arkansas General Assembly appropriated an additional \$475,762 earmarked for enhanced, technology-based professional development programs to be produced and furnished by the Arkansas Department of Education.

By taking steps toward recruitment and retention, Arkansas school districts may realize relief in their supply and demand mismatches. Another form of incentive that may be beneficial toward the resolution of geographical and subject area shortages is differential pay. Since these shortage types clearly exist for many districts, perhaps the market should be allowed to react accordingly.

REFERENCES

American Association for Employment in Education. (2002). *Educator Supply and Demand in the United States*. Columbus, Ohio: AAEE.

American Association for Employment in Education. (2005). *AAEE Educator Supply and Demand Research Study, 2005 Results*. Columbus, Ohio: AAEE.

Education Commission of the States. (2005). *The Progress of Education Reform 2005, Teacher Supply and Demand*. Denver, Colorado: ECS.

Education Week. (2003). *The Teacher Gap: Arkansas*. Retrieved from <http://counts.edweek.org/sreports/qc03/Templates/state.cfm?slug=17qcar.h22>

Education Resources Information Center, sponsored by The Institute of Education Sciences, United States Department of Education. (1999). *The Supply and Demand of Elementary and Secondary School Teachers in the United States*. Washington, D.C.: ERIC Digest.

Escalante, D., Burnham, B., & Eastmond, J. (2005). *Utah Educator Supply and Demand Study 2004-2005*. Logan, Utah: Utah State University.

Greene, Tristan. (2000). *Initial Research Memo -- Teacher Supply and Demand Issues*. Little Rock, Arkansas: Arkansas Department of Education.

Howard, Dr. M., & Stefanic, Dr. M. (2005). *Educator Supply and Demand in Idaho*. Boise, Idaho: Idaho Department of Education.

Illinois State Board of Education. (2005). *Educator Supply and Demand in Illinois*. Springfield, Illinois: ISBE.

Ingersoll, Richard M. (2001). *A Different Approach to Solving the Teacher Shortage Problem*. Seattle, Washington: Center for the Study of Teaching and Policy.

Ingersoll, Richard M. (1999). *Teacher Turnover, Teacher Shortages and the Organization of Schools*. Seattle, Washington: Center for the Study of Teaching and Policy.

Institute for School-University Partnerships, The Texas A&M University System. (2001). *Teacher Demand Study 2000-2001*. College Station, Texas: TAMU Publications.

Mid-continent Research for Education and Learning. (2003). *Teacher Supply and Demand in the State of Colorado*. Aurora, Colorado: McREL.

Mid-continent Research for Education and Learning. (2002). *Teacher Supply and Demand in the State of Wyoming*. Aurora, Colorado: McREL

Odden, A., Picus, L., Ritter, G., & Barnett, J. (2006). *State of Arkansas School Funding Analysis*. North Hollywood, California: Lawrence O. Picus and Associates.

Office for Education Policy. (2004). *Teacher Shortages in Arkansas*. Fayetteville, Arkansas: The University of Arkansas.

Oklahoma State Regents for Higher Education, Oklahoma State Department of Education. (2002). *2002 Teacher Supply and Demand Study*. Oklahoma City, Oklahoma: OSDOE.

Public Policy Institute of California. (2006). *Improving Teacher Retention in California Public Schools*. San Francisco, California: PPIC.

Schaerer, Vickers, Hansing & Harvey. (1996). *Teacher and Administrator Supply and Demand for the Southeast*. Southern Association of School, College and University Staffing. Dalton, Georgia: ERIC.

Southern Regional Education Board. (1995). *Educator Supply and Demand in Arkansas*. Atlanta, Georgia: SREB.

Southern Regional Education Board. (2003). *2003 Study of Teacher Supply and Demand in Tennessee*. Florence, Massachusetts: Data and Decision Analysis, Inc.

Southern Regional Education Board. (2005 & 2006). *Legislative Report* (various dates). Atlanta, Georgia: SREB.

APPENDICES

Appendix A: Determinants of Teacher Supply and Demand

Determinants of Supply

Attrition rates (1)

Retention rates

Re-entries to the profession

Expected certified graduates

Expected retirements (educator population/workforce age rising) (2)

Reserve pool (temporary re-entry) (3)

Reasons for leaving: (3)

Dissatisfied with professional prestige

Salaries and benefits

Family/child-rearing

Lack of administrative support

Opportunity in other fields (4)

Student discipline problems (5)

Determinants of Demand (6)

K-12 enrollment

Salaries and benefits

Student-teacher ratio requirements

Course and program requirements

Field of study

(1) 3 years = 29%; 5 years = 39% [Ingersoll, 2001]
3 years = 20%; one year = 9% [ERIC]
one year = 13% [Oklahoma]

(2) [Utah]

(3) [Tennessee]

(4) [Oklahoma]

(5) [ECS]

(6) [ERIC, AAEE]

Appendix B: Graphical Representations

Data received from the Arkansas Department of Education, The Arkansas Teacher Retirement System and the Arkansas Department of Higher Education were built into time series and utilized in statistical processes to attempt estimates and projections. The variable-series acronymic labels and data descriptions are as follows :

DEGREES = aggregate education-field diplomas awarded annually from all Arkansas institutions of higher education,

RETIREES = number of annual teacher retiree applications to the Arkansas Teacher Retirement System,

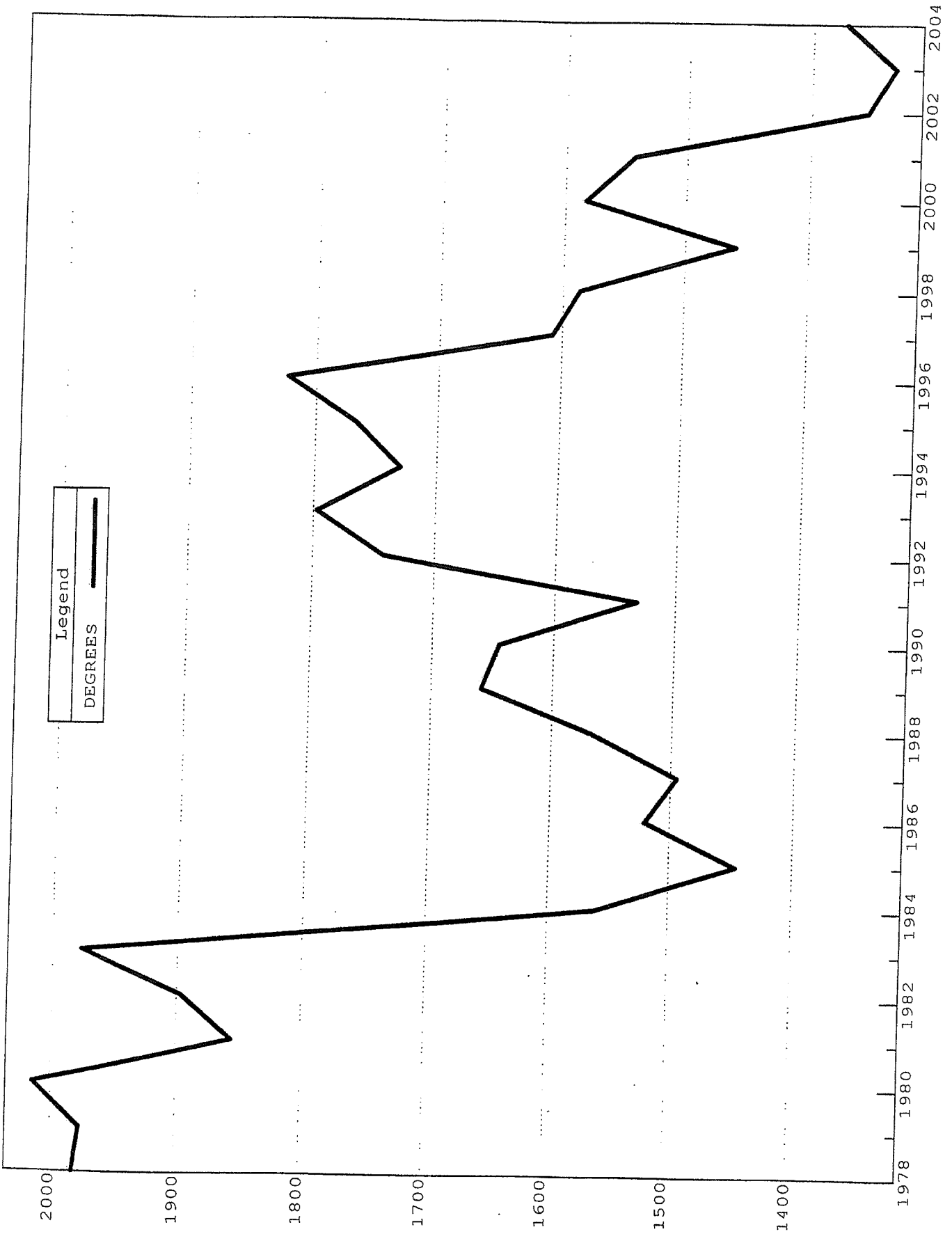
ADDITIONALTR = number of certified teachers added annually into the teacher retirement system

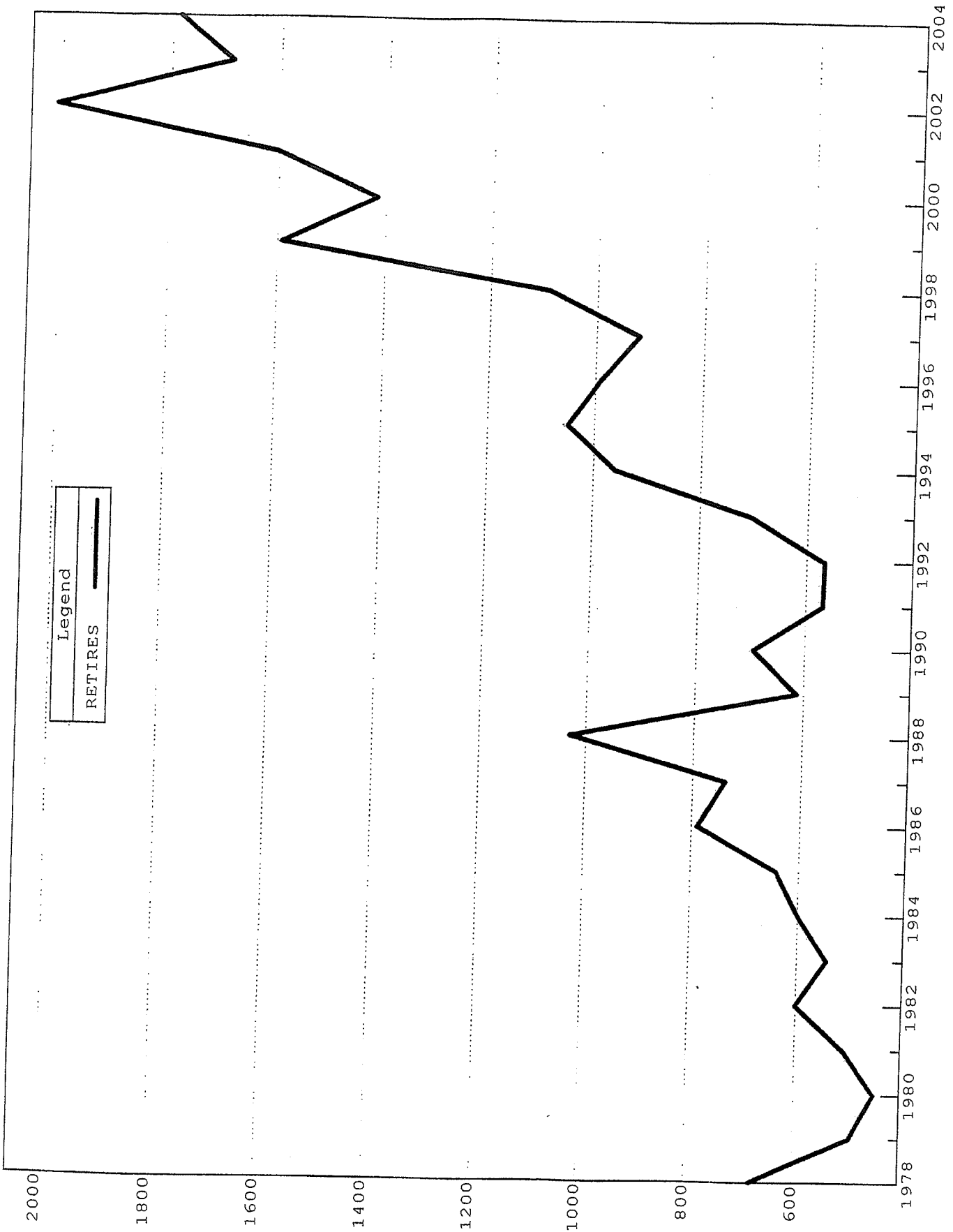
CERTIFIEDFTE = number of certified FTE recorded in the Annual Statistical Report of the Arkansas Department of Education,

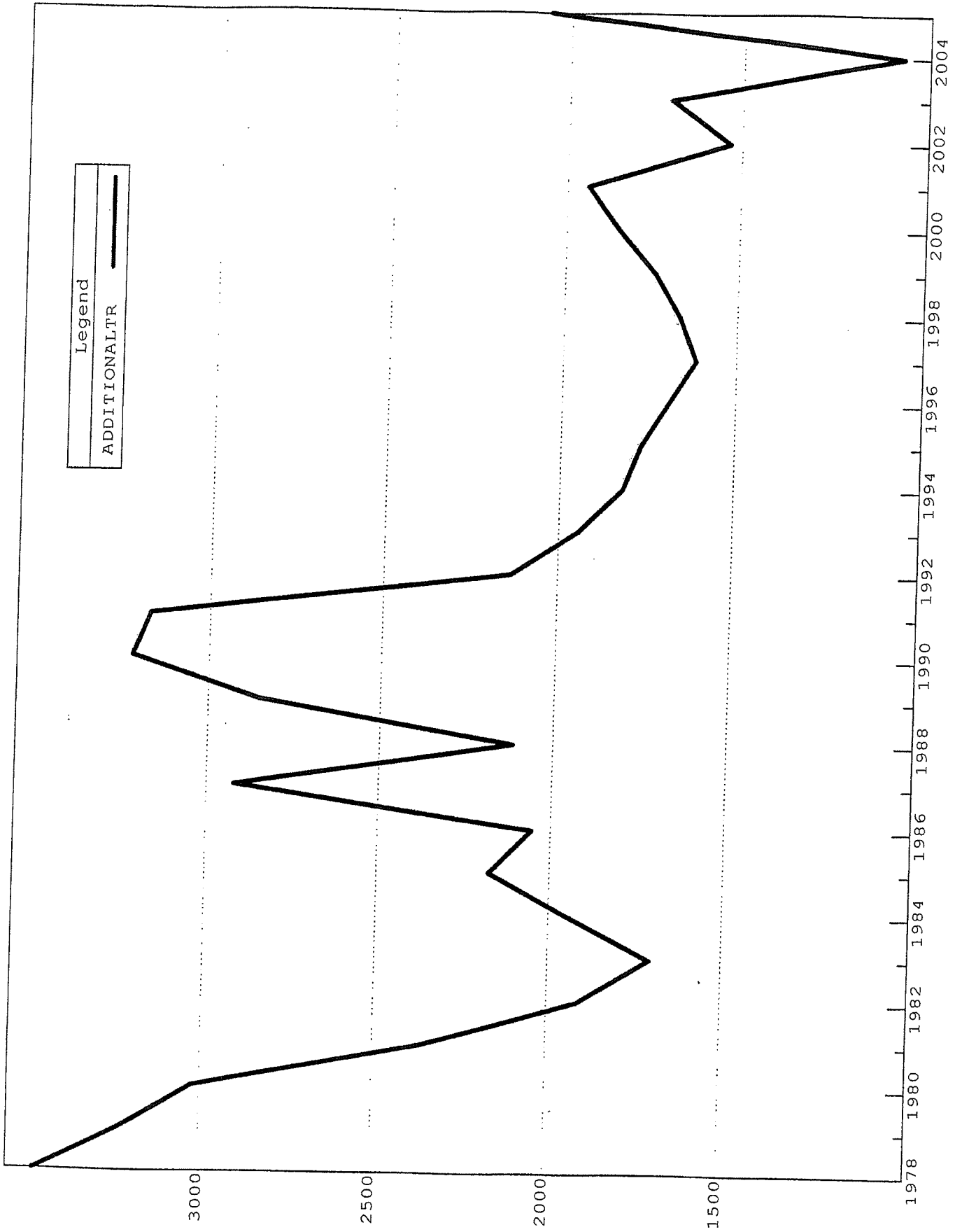
ADM = estimated annual statewide Average Daily Membership.

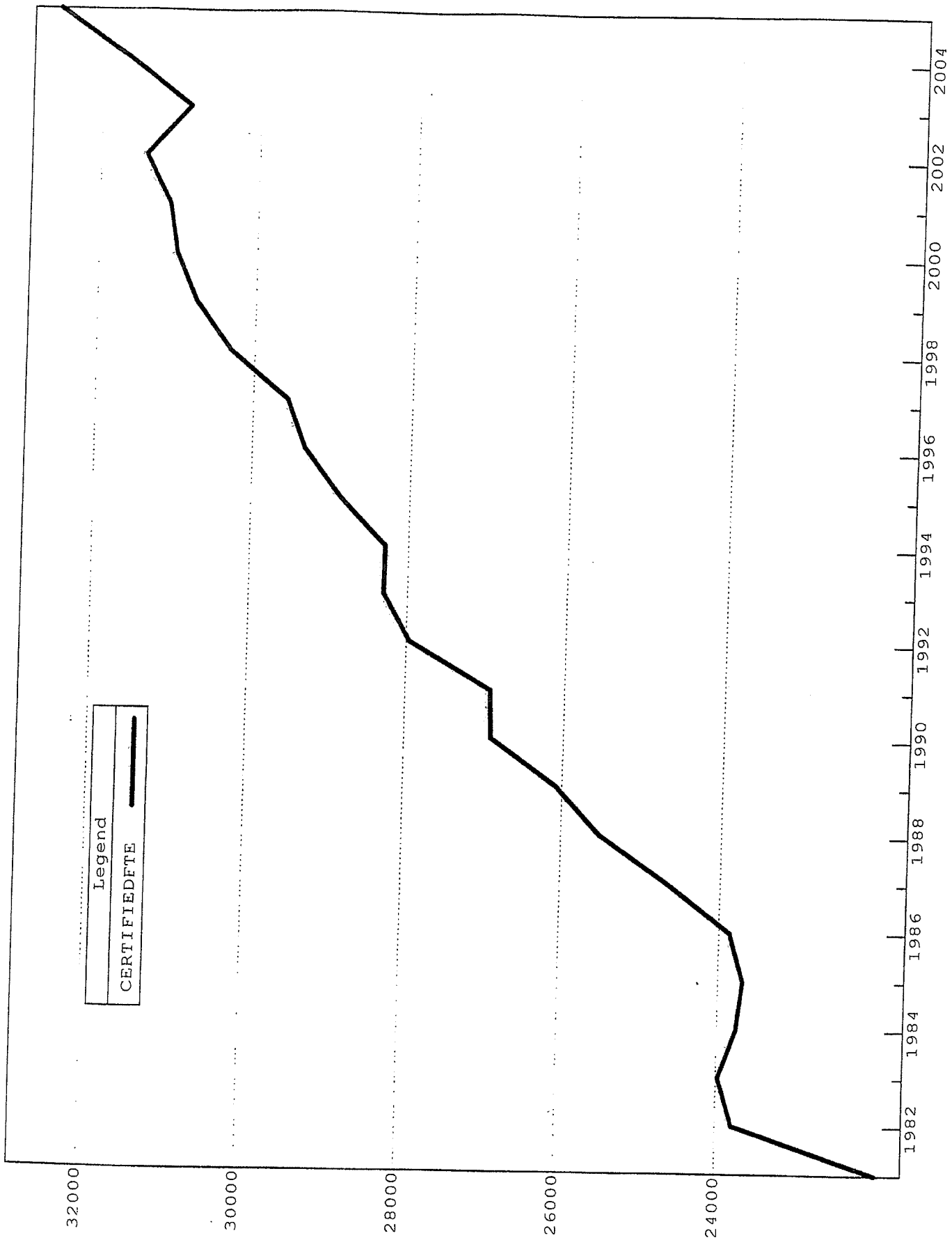
From the data received, all forecasts and projections derived therein were of little statistical quality except for the variable **CERTIFIEDFTE** (the series sample included the years 1981 through 2005). A forecast of **CERTIFIEDFTE** produced excellent predictability and within-sample statistics. All quality expectations and inference tests were met.

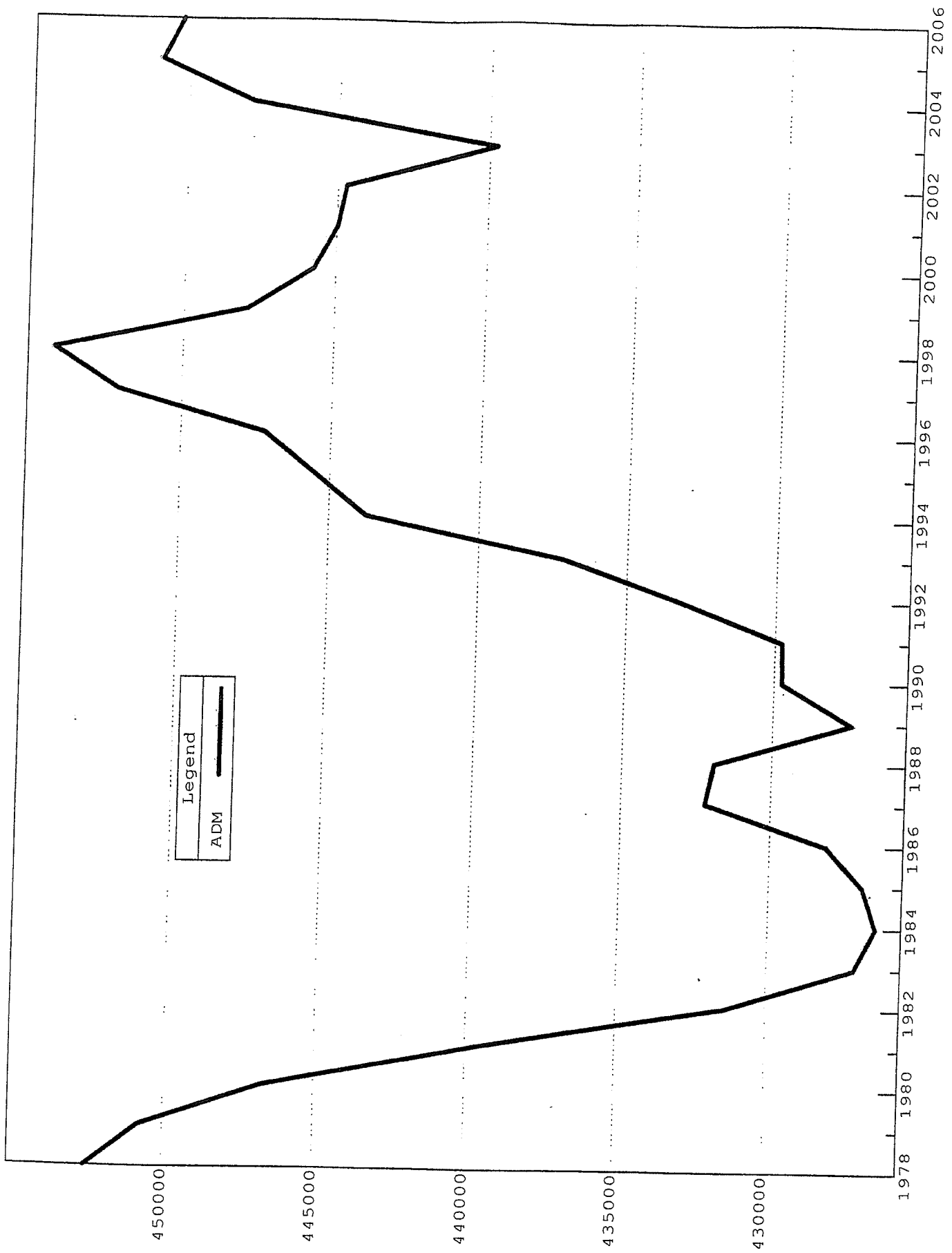
The forecast results suggest that the average expected annual rate of growth in **CERTIFIEDFTE** will be 1.179% over the next five years.

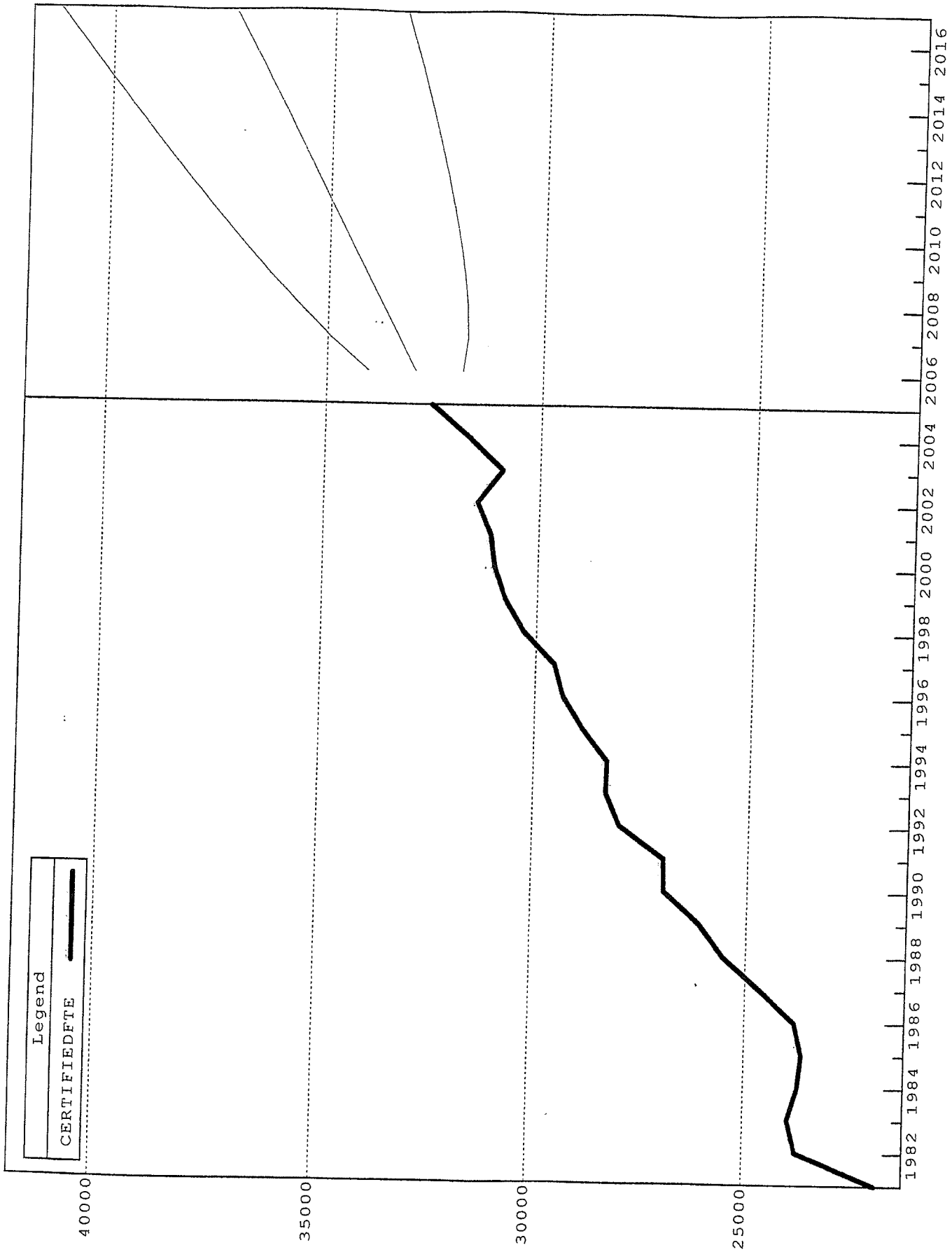












Appendix B, p. 8

<u>School Year</u>	<u>Total Retires</u>	<u>Total Education Degrees</u>
1977-1978	680	1982
1978-1979	498	1977
1979-1980	455	2015
1980-1981	511	1856
1981-1982	601	1897
1982-1983	546	1453
1983-1984	600	1392
1984-1985	642	1446
1985-1986	789	1521
1986-1987	740	1495
1987-1988	1030	1567
1988-1989	613	1659
1989-1990	695	1645
1990-1991	569	1532
1991-1992	568	1742
1992-1993	704	1797
1993-1994	960	1730
1994-1995	1050	1767
1995-1996	991	1823
1996-1997	920	1608
1997-1998	1090	1586
1998-1999	1592	1459
1999-2000	1416	1583
2000-2001	1603	1543
2001-2002	2007	1355
2002-2003	1688	1333
2003-2004	1785	1373

Appendix C, p. 1.

TOTAL DISTRICTS REPORTING A SHORTAGE

192

	TOTAL	%
AGRI	1	0.5%
ART	28	14.6%
ART-ELEM	5	2.6%
BAND	4	2.1%
COACH W/ADD'L CERT	1	0.5%
COUNSELORS	21	10.9%
BLDG ADMIN	7	3.6%
BUSINESS ED	2	1.0%
ELEM ED	5	2.6%
ENGLISH	19	9.9%
ESC	1	0.5%
ESL	3	1.6%
FOREIGN LANG	68	35.4%
G/T	6	3.1%
HOME EC	4	2.1%
JOURNALISM	1	0.5%
LIBRARY	8	4.2%
MATH	145	75.5%
MEDIA	1	0.5%
MIDDLE SCHOOL	8	4.2%
MUSIC	35	18.2%
PE/ELEM PE	3	1.6%
READING	3	1.6%
SCIENCE	123	64.1%
SCIENCE-BIOLOGY	1	0.5%
SCIENCE-CHEMISTRY	8	4.2%
SCIENCE-PHYSICAL	2	1.0%
SCIENCE-PHYSICS	8	4.2%
TOTAL ALL SCIENCES		142
SPECIAL ED	146	76.0%
SPECIALIZED AREAS	1	0.5%
SPEECH/LANG	3	1.6%
SPEECH		
THERAPY/PATHOLOGY	6	3.1%
SOCIAL STUDIES	1	0.5%
VOCATIONAL	6	3.1%

Appendix C, p. 2

TOTAL DISTRICTS REPORTING SURPLUS 163

	TOTAL	%
COACHES	10	6.1%
ELEM ED(P-4,1-6,EARLY CHILD)	132	81.0%
ENGLISH	2	1.2%
HEALTH	117	71.8%
HISTORY	7	4.3%
MIDDLE SCHOOL	6	3.7%
PE	68	41.7%
S. STUDIES	62	38.0%
BUSINESS ED	1	0.6%

Appendix C, p. 3

SURVEY COMPARISON TO 2006-07 CRITICAL TEACHER SHORTAGE LIST

19 Districts that reported shortages with schools on 06-07 STAR Critical Teacher Shortage List

LEA	COUNTY	DISTRICT
404	Benton	Gravette
503	Boone	Harrison
504	Boone	Omaha Valley
505	Boone	Springs Cross
1901	Cross	County
2901	Hempstead	Blevins Mineral
3104	Howard	Springs
3809	Lawrence	Hillcrest
4401	Madison	Huntsville
5703	Polk	Mena
5704	Polk	Van Cove
5903	Prairie	Hazen
6001	Pulaski	Little Rock
6505	Searcy	Ozark Mountain Mountain
6901	Stone	View
7001	Union	El Dorado
7104	Van Buren	Shirley
7204	Washington	Greenland
7510	Yell	Two Rivers

11 Districts that didn't respond with schools on 06-07 STAR Critical Teacher Shortage List

LEA	COUNTY	DISTRICT
506	Boone	Lead Hill
1406	Columbia	Waldo
1704	Crawford	Mulberry
1802	Crittendon	Earle
2903	Hempstead	Hope
5607	Poinsett	Weiner
5705	Polk	Wickes
6703	Sevier	Horatio
7009	Union	Strong
7401	Woodruff	Augusta
7504	Yell	Dardanelle

Correlations

Appendix D: Correlation Matrix

[DataSet1] H:\Teacher Supply & Demand Data\SPSS_SuperData.sav

Correlations

		FTEnow	FTEnext	FTEfive	OutCert	HomGrown
FTEnow	Pearson Correlation	1	.998**	.975**	.637**	.093
	Sig. (2-tailed)		.000	.000	.000	.222
	N	193	187	147	189	174
FTEnext	Pearson Correlation	.998**	1	.986**	.623**	.095
	Sig. (2-tailed)	.000		.000	.000	.217
	N	187	187	147	183	171
FTEfive	Pearson Correlation	.975**	.986**	1	.686**	.020
	Sig. (2-tailed)	.000	.000		.000	.814
	N	147	147	147	145	136
OutCert	Pearson Correlation	.637**	.623**	.686**	1	.137
	Sig. (2-tailed)	.000	.000	.000		.075
	N	189	183	145	189	171
HomGrown	Pearson Correlation	.093	.095	.020	.137	1
	Sig. (2-tailed)	.222	.217	.814	.075	
	N	174	171	136	171	175
Turnover	Pearson Correlation	.061	.056	.012	.132	-.187*
	Sig. (2-tailed)	.404	.451	.891	.077	.015
	N	186	181	143	182	169
LRTot	Pearson Correlation	.885**	.876**	.878**	.567**	-.077
	Sig. (2-tailed)	.000	.000	.000	.000	.419
	N	122	119	96	120	113

Correlations

[DataSet1] H:\Teacher Supply & Demand Data\SPSS_SuperData.sav

Correlations

		FTEnext	FTEfive	Needs1	Needs2	Needs3	Needs4
FTEnext	Pearson Correlation	1	.986**	.493**	.346**	.376**	.353**
	Sig. (2-tailed)		.000	.000	.005	.000	.002
	N	187	147	85	64	85	76
FTEfive	Pearson Correlation	.986**	1	.793**	.543**	.820**	.643**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	147	147	75	52	70	61
Needs1	Pearson Correlation	.493**	.793**	1	.483**	.728**	.618**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	85	75	87	58	59	55
Needs2	Pearson Correlation	.346**	.543**	.483**	1	.366**	.585**
	Sig. (2-tailed)	.005	.000	.000		.005	.000
	N	64	52	58	67	58	47
Needs3	Pearson Correlation	.376**	.820**	.728**	.366**	1	.295*
	Sig. (2-tailed)	.000	.000	.000	.005		.023
	N	85	70	59	58	88	59
Needs4	Pearson Correlation	.353**	.643**	.618**	.585**	.295*	1
	Sig. (2-tailed)	.002	.000	.000	.000	.023	
	N	76	61	55	47	59	78

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Regression

[DataSet1] H:\Teacher Supply & Demand Data\SPSS_SuperData.sav

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	OutCert, Needs1, LRTot ^a		Enter

a. All requested variables entered.

b. Dependent Variable: FTEfive

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.976 ^a	.953	.950	49.202

Model Summary

Model	Change Statistics				
	R Square Change	F Change	df1	df2	Sig. F Change
1	.953	305.733	3	45	.000

a. Predictors: (Constant), OutCert, Needs1, LRTot

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2220364.4	3	740121.459	305.733	.000 ^a
	Residual	108936.44	45	2420.810		
	Total	2329300.8	48			

a. Predictors: (Constant), OutCert, Needs1, LRTot

b. Dependent Variable: FTEfive

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	30.956	12.275		2.522	.015
	Needs1	7.899	.670	.410		
	LRTot	5.432	.970	.399		
	OutCert	8.305	1.261	.458		

a. Dependent Variable: FTEfive