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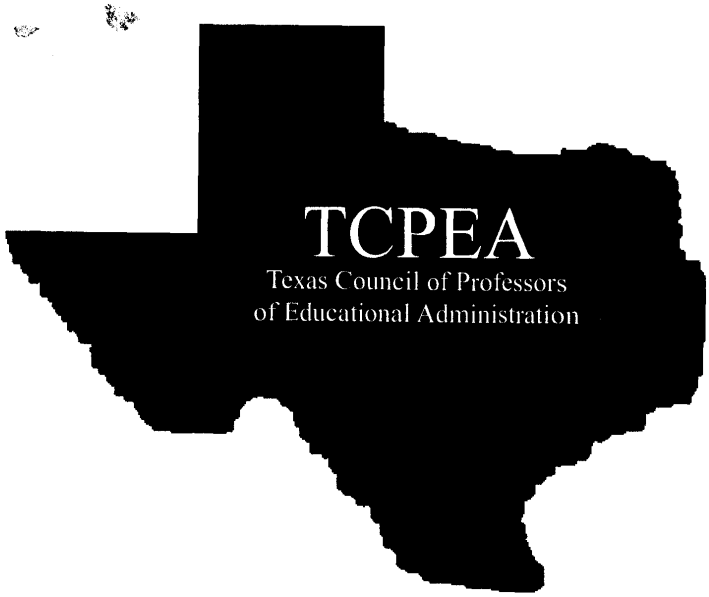

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The RTP Index: Measuring Equity in Texas Public School Funding

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The degree of equity in school funding systems has been a major factor in the development of methodologies for funding schools. School funding models have been in various stages of development since the 1840s when all education was provided by individual or private sources. The process was largely evolutionary through the first 130 years, but has become somewhat revolutionary since the 1970s with the proliferation of lawsuits challenging various states' methods of providing financial support for its schools.

The debate over state funding, both legal and intellectual, has brought about the interest of the statisticians, which resulted in attempts to quantify the relative degree of equity that exists in school finance models. The list of researchers in this area is long and distinguished, including such names as Berne and Stiefel (1984, 1999), Odden and Picus (1992, 2004), and Verstegen (1996).

Equity is defined as "the quality, state, or ideal of being just, fair, and impartial" (Multi-Ethnic Think Tank, 2002, p. 11). Swanson and King (1997) suggest a concept of distributive equity that is concerned with inequitable conditions created by the design of government. The Texas courts, in Edgewood v. Kirby (1989) decreed that equity is substantially equal access to revenues at like tax effort. This focus on a concept of equity suggests that there should be no significant differences in access to per pupil revenue for reasons that are beyond the district's control.

Purpose of the Study

The purpose of this study was to examine the degree of equity in funds available for access through the current funding system for public schools in Texas. More specifically, this study statistically addressed the accessibility of funding in the Texas Foundation School Program and then defined a new process, the Revenue-to-Population Index or *RTP Index*, to compare each school district based on this data.

Significance of the Study

This research is significant in three major areas. First and foremost, current literature on state formula funding in Texas has not used a normalized statistical technique in assessing the equity of the formula funding system, as measured by school district size and weighted average daily attendance (WADA) access to funding, compared against the funds districts and students actually

receive. Second, current literature does not provide a means of comparing equity or inequity among individual school districts across the state. This deficiency must be addressed in order to further reforms and to contribute substantively to the dialogue on restructuring the current system. With so much history of revision, legal challenges and the like, it is important to take a fresh, new, critical look at the system. Finally, as alternatives and changes to the Foundation School Program in Texas are contemplated, this study, also, provides a vehicle, the *RTP Index*, for comparing the equity merits of new, existing, and/or emerging proposals.

Methodology

This project utilized a quasi causal-comparative research design. Specifically, the researchers, utilizing current data provided by the Texas Education Agency and The Equity Center, set out to determine "consequences of differences that already exist between or among groups" (Fraenkel and Wallen, 2003, p.368). In the case of this research project, both school districts and WADA were considered as parts of the analysis. While this study does examine differences that have already occurred and were thus analyzed retrospectively, the term "quasi" was added to the design description because this research also attempts to formulate a method for analyzing future proposals of formula funding within the state. This final additional element takes this design beyond the scope of Fraenkel and Wallen's definition and moves it into the quasi-comparative arena.

Research Questions

This research was guided by the following research questions:

1. What is the degree of equity and fiscal neutrality in the methodology for providing access to funds in the current system of formula funding in the Texas Foundation School Program?
2. How do Texas School Districts compare in equity to other school districts as measured by percent of weighted student versus percent of available formula funding-generated dollars?

Population and Sample

In responding to the first research question, the total population was considered and a purposeful sample of the population was collected and utilized "to select unique cases that are especially informative." (Neuman, 2004, pp. 138 & 139). Since 82% of WADA in the state of Texas are consider to be in Tier II districts, our purposeful sample was designed to include the 18% of those outside Tier II. While the purpose of Tier I is to fund the basic programs, Tier II is for the purpose of enriching the basic program. (Financial Accountability system Resource Guide, 2003)Therefore, the selected sample population consisted of the upper 18% and the lower 18% of WADA ranked by per WADA revenue. This purposeful sample was selected from the total population of public independent school districts in Texas (n=1031) that were eligible to access state formula-funding. All students within the State of Texas equate to 5, 336,535. Thus the purposeful sample utilizes the bottom 18% and the top 18%

or approximately 1,923,083. The purposeful sample of 36% of the state's total WADA equates to 774 public school districts (N=774). This sample was utilized in order to omit the repetition of districts falling within the Tier II funding system. The intent of drawing this purposeful sample of the population was to examine the true inequities within the system.

In order to address the second research question, the total population was analyzed. This total population consisted of all 1031 school districts in the State of Texas. Data from the total population were collected and utilized. Charter schools and private schools were intentionally omitted from this study due to a funding system that is not related to local property wealth.

Data Collection and Analysis

Data were collected from online sources including the Texas Education Agency (2002) and directly from the Equity Center in Austin, Texas. Specifically, data from the 2004 fiscal year was used as it represented the last completed year of state funding. The definition of state funding used in this report assumes that all districts are at $1.50 M&O and $.29 of existing debt allotment (EDA Program) comprised exclusively of bond debit with first payment on or before August 31, 2005. (Texas Education Agency, 2005) In order to address the two research questions, the study then utilized three statistical treatments for equity analysis of this data and a graphical representation for fiscal neutrality. This study utilized the three most commonly used measures of equity which have been associated with previous studies in school finance, i.e. the Gini coefficient, the coefficient of variation, the Verstegen Index, along with a graphical representation of fiscal neutrality.

The Gini coefficient is used as a major indicator of the equity in the formula funding mechanism employed by the state of Texas. The decision to use this statistical procedure to demonstrate the relative equity in wealth access across schools districts is based on the definition of the Gini coefficient noting that this procedure takes into account the total range of data within the set. It is important to note that rather than pupil counts, such as Average Daily Attendance (ADA), this study used Weighted Average Daily Attendance (WADA) because primarily this variable drives funding in the Foundation School Program. Average Daily Attendance is the count of students for a period of days divided by the number of days of attendance while WADA is "the number of students in Weighted Average Daily Attendance, which is calculated by dividing the sum of the school district's allotments under Subchapters B and C, less any allotment to the district for transportation, any allotment under Section 42.158, and 50% of the adjustment under Section 42.102, by the basic allotment for the applicable year" (Texas Education Agency, 2005). The exception to this was in calculating the funding driven by Chapter 46 (facilities funding) where ADA was noted as the metric to be used (pupil count) due to the current funding formula.

The Gini coefficient is derived from the Lorenz curve, a cumulative frequency curve that compares the distribution of a specific variable with the uniform distribution that represents equality. A diagonal line represents

perfect equality, and the greater the deviation of the Lorenz curve from this line, the greater the inequality. The Gini coefficient is double the area between the equality diagonal and the Lorenz curve, bounded below by zero (perfect equality) and above by one (the case when a single member of the population holds all of a particular resource.) The purest use of the Gini occurs when individual data are used. If only group data are available, the Lorenz curve will not be precise (Hale, 2001). This study used individual data as the revenue available to each WADA in the state as part of the sample; therefore the Gini coefficient analysis was utilized. The Verstegen Index was also utilized to measure the degree of concentration of resources in the top half of the distribution (Odden & Picus, 2004. p.67). This measurement calculates the ratio of the total amount of resources above the median and the amount that would be available to the same number of observations at the median per WADA revenue. The coefficient of variation among districts and WADA is shown to illustrate the percent variation about the mean (Odden & Picus, 2004, p. 64). The coefficient of variation is simply the standard deviation divided by the mean. This study used a graphical treatment for illustration of fiscal neutrality in the Foundation School Program. Specifically, a graph was formulated to represent each school district's available revenue per WADA plotted in relationship to the school property wealth per WADA.

Presentation of the Data

In this section, data are presented and discussed to address each of the research questions. The Lorenz curves, as explained in the previous section, are depicted in Figures 1 and 2. The results of the analysis are provided in Table 1 with benchmarks that are widely accepted in the research community. A graph illustrating Fiscal Neutrality is provided as Figure 3.

Research Question 1

What is the degree of equity and fiscal neutrality in the methodology for providing access to funds in the current system of formula funding in the Texas Foundation School Program?

The degree of equity and fiscal neutrality in the methodology for providing access to funds in the current formula funding in the Foundation School Program was analyzed. This analysis focused on the revenue available or accessible to districts rather than the amounts of revenue that districts actually receive. This approach allowed the focus to be placed on the *system* and not on the *actions* of the individual districts since revenue realized by individual school districts reflected local tax rates and tax collection procedures.

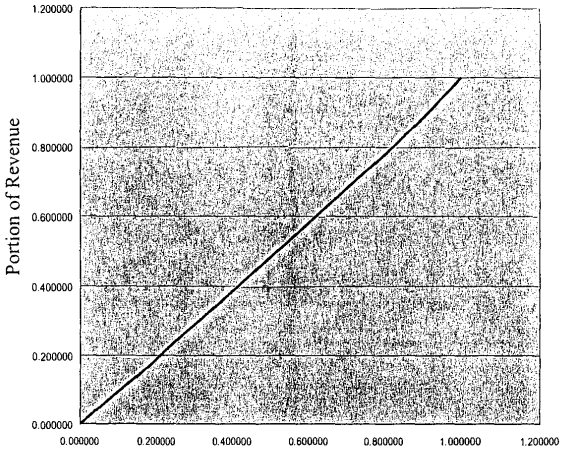

Figure 1. Portion of Population versus Portion of Revenue

The analysis of *Research Question 1* was completed on the total of revenue available in the Foundation School Program. This study presents two perspectives by which to apply the tests for equity in the system. The entire system (Figure 1) is evaluated which includes all WADA and districts and a purposeful sample population (Figure 2) was also analyzed using the Gini Coefficient and the Lorenz Curve.

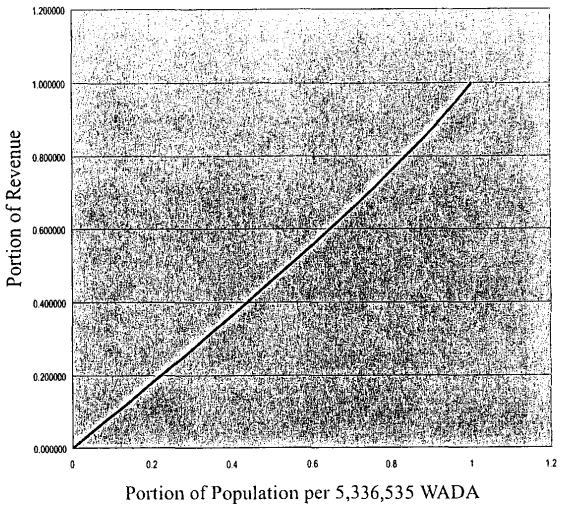

Figure 2. Purposeful Sample Population (Top and bottom 18% of the WADA Population)

The purposeful sample included the 18% of WADA receiving the lowest per WADA revenue and the 18% of WADA receiving the largest portion per WADA revenue. The purposeful sample is presented as an alternative that would, perhaps, compensate for the potential masking of differences in per WADA funding due to the enormity of the system. As mentioned before, the 18% figure was arrived at because the system is, seemingly, equalized at the 82nd percentile.

The results of the statistical treatments are interesting even if somewhat contradictory. The Gini coefficient based on the total system is well within the benchmark for equity; however the Gini coefficient for the purposeful sample demonstrates the existence of considerable inequity. This mixed result, seemingly indicates that the magnitude of the numbers tend to mask the differences in funding levels.

Table 1

Results of Statistical Procedures on Both Population and Stratified Sample

Statistical Treatment	Participants		Benchmark
	Population	*Purposeful Sample*	
Gini Coefficient	0.03	0.06*	0.05
Verstegen Index	1.06*	1.13*	1.00
Coefficient of Variation (WADA)	0.09	0.13*	0.10
Coefficient of Variation (District)	0.19*	0.21*	0.10

* Exceeds Benchmark (Odden & Picus, 2004, pp. 64-67)

The coefficient of variation of 0.19 by district for the total system and 0.21 (Table 1) for the purposeful sample population (by district) are, in both cases, outside the benchmark of 0.10. These results would indicate that there are *great differences* in the amount of per WADA revenues available between those with the greatest access and those at the level of least access. The Verstegen Index (Table 1) of 1.06 for the total system and 1.13 for the sample population indicates by the range above 1.0 (1.0 indicating equal), that there is a considerable amount of per pupil revenues concentrated in the upper half of per pupil revenue access as compared to those at the median. The Verstegen Index is the actual revenue in the upper 50% of observation as compared to revenue available for the same observation at the median revenue.

Examination of the graph (Figure 3) illustrating fiscal neutrality in the system indicates that there continues to be a significant relationship between per WADA property value and per WADA revenue. This relationship is particularly strong at the extreme end of the per WADA property value scale (x-axis). The spikes in the per WADA revenue graph for those in the lower (approximately 80%) segment of property wealth are, seemingly, due to differences in leveling revenue such as CEI and district size adjustments for rural, urban, and metropolitan districts.

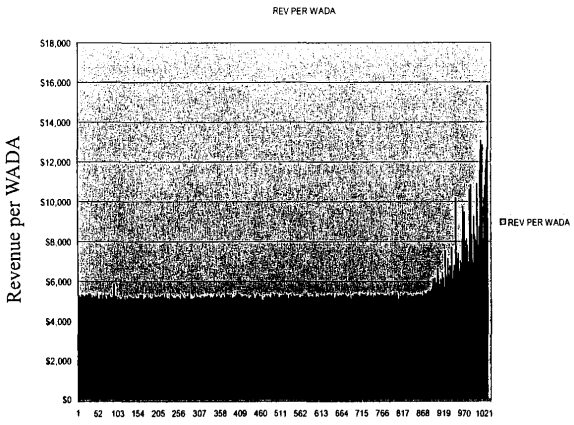

Figure 3. Fiscal Neutrality Comparing Equal Access to Similar Revenue per Student at Similar Tax Effort

Research Question 2

How do Texas School Districts compare in equity to other school districts as measured by percent of weighted students versus percent of available formula funding-generated dollars?

In order to compare equity in available funding access among the 1031 school districts in Texas, the "Revenue-to-Population" (RTP) Index was developed within this study for the purpose of creating a simplified method of comparison between available funding for districts. The index was calculated by dividing the percentage of school district funds which were available to each district by the total weighted average daily attendance within the district. The result was a number that could be easily understood and compared. The *RTP Index* was calculated as follows:

$$\frac{\text{Percentage of Funds Available (PFA)}}{\text{Percentage of Total WADA (PTW)}} = \textit{RTP Index}$$

The *RTP Index* was calculated for each district based on its WADA and

total access to funds in the Foundation School Program. This is a combined composite index representing the discrepancy, if any, in school funding equity at the individual district level.

The *RTP Index* was then used to calculate available funding equity across the 1031 school districts in Texas. This index can be used to represent the funding which districts *receive* compared to that which *is available* to each district. Data are presented in regard to the ratio of percent of revenue to the percent of population. A complete listing of RTP Indices for all Texas public schools can be found on the Texasisd.com website and in the report, *Funding Public Schools in Texas: How Do We Quantify Inequity?* (Bingham, Jackson, & Jones, 2005).

The *RTP Index* is based on the assumption that in a totally equitable system (in terms of access to revenue) that every WADA and district would have an *RTP Index* of 1. Interestingly, the actual RTP Indexes for the 1031 school districts in Texas ranged from 0.85 to 2.91. That is, whatever percent of total population a student (WADA) represents, that individual would receive the same percent of available revenue so in a totally equitable system of 1% WADA would receive 1% of the available formula revenue.

In the case of the Foundation School Program, where the mean of per WADA revenue is $5428, a WADA in a district with an *RTP Index* of .85 would have access to 85% of $5428 or $4614, which would be $844 less than the district's equitable entitlement per WADA. Conversely, a district with an *RTP Index* of 1.45 is receiving 145% of the equitable WADA. This equates to $7870 per WADA or $2442 more than the equitable amount of $5428. In this case, the district with the higher *RTP Index* is receiving $3256 more per WADA than the school district with the *RTP Index* of .85. Thus, the significant range of RTP values clearly suggests a marked difference in the amount of revenue available for school districts in the Foundation School Program, the current funding system in Texas.

Findings and Conclusions

The intent of this research was to provide some insights into the relative equity of the access to funds in the Texas Foundation School Program. Based on 2004 fiscal data and regulations in place at that time, the system was providing funding for more than five million WADA and access to funds nearing thirty billion dollars ($30 Billion). The analysis of the data reveals a system that is reasonably equitable in terms of the most widely accepted methods of analysis. Enthusiasm must be tempered for the degree of equity demonstrated by the Gini coefficient in light of the wide disparity in available funding within the system by the unacceptably high levels of variance as shown in the coefficients of variation by WADA and by district. There is also a concentration of per pupil revenue in the upper 50% of that hierarchy, along with a troubling relationship between per WADA property wealth and per WADA revenue.

Any analysis of the data will reveal that the Foundation School Program is heavily reliant on local property taxes. Further examination indicates that in any school funding system that relies on property taxes to fund or supplement

the system, equity and recapture are inseparable. It follows immediately that the greater the reliance on local property taxes, the more volatile the issue becomes between those who insist on equity and those who resent recapture.

The *RTP Index* values give voice to the equity and inequity of the system by providing a means of comparing and communicating the differences among districts. This index also gives key district leaders and policy-makers important data for identifying potential funding short-falls for their district in order to bring about dialog and subsequent actions for eliminating such short-falls. This index will also lead to district and state examination of these short-falls in order to unmask issues surrounding funding availability.

Data in the study also highlights the importance of accessing all funds available in the formula-funding system and thus the concern that some school districts may not be accessing the full funding available to them. It is a common factor for funding to be unavailable to districts due to some economic anomaly. It is of little use to districts to have available funding and not have the ability to obtain or access and use these funds. This anomaly widens the inequity gap and further complicates the problem of equitable funding for school districts. The *RTP Index* developed within this study can be used to simplify communications concerning the current funding system and to address its effects upon districts. It is important to note that districts not reaching equity of 1.0 on the *RTP Index* should seek to identify reasons for this short-fall whether it is current lack in Weighted Average Daily Attendance or disparities in taxes owed or taxes paid.

As Texas moves toward revisions in the public school funding system, the *RTP Index* can also be used to gauge the equity of any proposed funding systems before engagement. Further, the *RTP Index* gives individual school district leaders and school boards a means to compare their district's equity position in comparison to the state funding system as well as other school districts in similar situations.

As discussed at the beginning of this article, the Texas public school finance system has been in and out of court for much of the last two decades. This reality clearly indicates the need for a new look at the funding equity questions across the system and the need for benchmarking the existing system in order to facilitate future system revisions. It is this benchmarking that becomes the major implication of this research. It is only when we completely understand the implications of changing funding formulas or continuing to use existing systems, that policy and lawmakers can chart a path for improvement. By using the *RTP Index* to pin-point funding availability we can vastly improve the tracking of these inequities. Hopefully the use of this technique can also reduce the likelihood that future funding systems will end up in the court system, as a result of challenges posed by individuals or districts that are perceived as not being treated fairly or equitably. Under a democratic system, fair and equitable treatment under the law is the expectation and the right of every student.

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