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BALANCING EQUALIZATION WITH INCREASED REVENUE FOR EDUCATION: EXPANSION OF LOCAL TAX EFFORT UNDER NEW MEXICO'S STATE EQUALIZATION GUARANTEE

Ian M. Kleats

This paper attempts to examine the capacity of New Mexico's education funding formula to increase equalized expenditures through an expansion of local tax effort by using a stylized partial equilibrium model based on the presence of a willingness to pay from one locality for another locality to increase its local tax effort. Two options for acting on this willingness to pay are presented, and the implications to educational expenditures and disparity are analyzed through a simulation. Simulation results are compared to New Mexico data, illustrating certain model limitations and which extensions might prove useful.

Keywords: education policy, education finance, equalization, willingness-to-pay.

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Ian M. Kleats: New Mexico Legislative Education Study Committee, New Mexico Legislature, Santa Fe, NM, USA (ian.kleats@nmlegis.gov)

I. INTRODUCTION

The New Mexico State Equalization Guarantee, or SEG, is a unit-equalized educational funding formula seeking to address components of both horizontal and vertical equity. With respect to vertical equity, the formula establishes program units of educational need using cost differential factors based on: (1) grade-level membership; (2) special education membership; (3) bilingual, fine arts, and elementary physical education program participation; and (4) other program and school characteristics. With respect to horizontal equity, a student of specific characteristics will generally generate the same number of units, and therefore funding, regardless of local school district wealth.

For the purposes of the SEG, statewide program cost is the total amount of operational revenue covered by the formula, including legislative appropriations and a percentage of both local property tax revenue and certain federal funds. Each program unit generates a uniform dollar value where the unit value is equal to the statewide program cost divided by the total number of program units statewide. The SEG distribution for each school district is the district's program cost, which is defined as the district's total units times the unit value, less 75 percent of local property tax revenue and federal funds from the Impact Aid and Forest Reserve programs.

On its face, it would appear that the education finance system in New Mexico is a foundation. This appearance is somewhat misleading, however. Due to the high percentage against which local revenue is taken credit within the state funding formula and extremely low caps to local operational mill levies, just over 93 percent of all operational revenue for public education comes from legislative appropriations to the SEG. Although not reflective of all the most recent education finance reforms in New Mexico, including a reduction in the percentage against which local revenue is taken credit within the state funding formula from 95 percent to

75 percent, Jordan, Garcia, Kops and Jordan (1998) provide a comprehensive description of the structure of and issues facing public school finance in the state, which is still generally consistent with current law.

Additionally, some of the concerns relating to sufficiency of educational funding raised by Jordan, Garcia, Kops and Jordan (1998) are still prevalent in today's discussions within the state. With that in mind, the primary goal of this paper is to evaluate the capacity of New Mexico's public education funding formula to increase equalized educational revenue through the expansion of local tax effort.

That fundamental question is not typically examined in the literature because minimum foundation programs do not generally limit the maximum revenue a district may raise, with several exceptions, California being the most notable among them (Card and Payne, 2009). When such limits to local revenue generation have been examined, the literature has focused on the qualitative effect on educational outcomes and the quantitative effect on average state aid funding for states imposing a cap relative to states without a cap, and whether or not that finance reform was the result of litigation (citations). Although that body of work is significant to the discussion of why the capacity for increasing equalized educational revenue through local tax effort under a foundation program may be important, it does not address the actual capacity of any given state.

I attempt to answer the question of this capacity by following in the vein of Fernandez and Rogerson (2003) and Ferreyra (2009), who conducted quantitative welfare analysis of school finance policies. However, whereas the work of those authors utilized general equilibrium models backed with econometrically-estimated parameters to address welfare implications of school finance policy in a general and very specific context, respectively, this paper presents a

highly stylized model of partial equilibrium under the hypothetical ability of a school district to act upon its willingness to pay for another school district to increase its local tax effort dedicated to the state aid formula.

In Section 2, a stylized model of education finance is proposed based on certain assumptions, including the presence of only two school districts, across several finance systems. The willingness to pay/accept a marginal increase in the local tax rate of one district to contribute to the state funding formula is detailed, and the form of revenue sharing agreements or a similar mechanism is described as a partial equilibrium to the model. A functional form necessary to obtain general equilibrium results is presented, though not explored further.

In Section 3, a simulation based on the functional forms arrived at in the second section is presented, and parameter values for the simulation are chosen to show baseline results. Ranges for willingness to pay/accept are then calculated based on two different objectives, and the resulting induced local tax efforts are evaluated with respect to the impact on aggregate educational expenditures and disparity.

Finally, in Section 4, the simulation results are compared to empirical data from New Mexico, and the paper attempts to explain inconsistencies between the model's predictions and the empirical data through the context of the statutory and regulatory structure facing the state. This comparison yields areas where additional complexity may be needed in the model to more accurately reflect the state's characteristics, and Section 5 concludes the paper by beginning to address whether the state has further capacity to increase local tax effort for education under its equalization regime.

II. A MODEL OF EDUCATION FINANCE

A. Initial Model Assumptions

The model considers a population that consists entirely of households which, starting with some positive endowment (y), must decide between a level of the private consumption good (c) and the per pupil education expenditure (q) that is paid for through some form of tax on the household, where each household is assumed to have a single student. Each household has one of two initial endowments, one high (rich) and one low (poor).

Government provides a single good, education, which is delivered through two independent school districts, each with taxing authority. Each household lives within a school district, and the households are sorted into these two school districts by income, resulting in the richest school district and the poorest school district.

Each household seeks to maximize the same continuous social welfare subject to its income constraint:

$$U = q^{\alpha} c^{\beta} \tag{1}$$

Three education finance systems are considered in this paper: a local system, a state system, and a hybrid system of fully-equalized educational funding solely with revenue from independently-determined local tax rates. The tax structure of each education finance system will respectively define the equations for q and c.

The local system is characterized by a complete absence of redistribution. Each district is able to choose a tax rate to fund per pupil education expenditures and private consumption in accordance with its preferences:

$$(2a) \qquad q_i = t_i y_i$$
$$(2b) \qquad c_i = (1 - t_i) y_i$$

The state system is characterized by identical per pupil educational expenditures between the two districts funded by a uniform tax rate applied to the initial endowments within both districts:

$$(3a) \qquad q = \frac{\tau_S (N_1 y_1 + N_2 y_2)}{N_1 + N_2}$$
$$(3b) \qquad c_i = (1 - \tau_S) y_i$$

Finally, the hybrid system is characterized by fully-equalized educational expenditures, similar to the state system, but is solely funded with revenue from independently-determined local tax rates:

$$(4a) \qquad q = \frac{t_1 N_1 y_1 + t_2 N_2 y_2}{N_1 + N_2}$$
$$(4b) \qquad c_i = (1 - t_i) y_i$$

It is further assumed that tax rates will be determined by referendum within the relevant political level, being either at the state level with households from both districts voting or at the district level with only households within a given district voting.

B. Willingness to Pay and Willingness to Accept

Under the state and hybrid systems, where revenue for education is distributed with perfect equity at the level of the pupil, it is evident by inspection that either school district would benefit from a donation to the state funding formula by the other district. Hence, even at the

point when the households within a district would be unwilling to levy an additional tax upon themselves dedicated to the state funding formula, it exhibits some positive willingness to pay the other school district to make such a donation through the imposition of a local tax.

In order to define this willingness to pay, this paper utilizes compensating variation expressed in terms of a deflator applied to educational expenditures per pupil:

$$(5) \qquad q_i^{\alpha} c_i^{\beta} \sim (cv_i * q_i^{'})^{\alpha} c_i^{'\beta},$$

which, after some simplification, yields the following aggregate district-wide willingness to pay for the non-contributing school district:

$$(6) \qquad WTP_i \leq N_i * (1 - cv_i) * q_i^{'}.$$

The minimum willingness to accept for the contributing school district can be obtained with similar simplification:

$$(7) \qquad WTA_j \geq -N_j * (1 - cv_j) * q_j^{'}.$$

For the sake of completeness, similar equations can model the willingness to accept an increase to the local tax rate if the compensating variation were applied to consumption of the private good for the contributing district:

$$(8a) \qquad q_j^{\alpha} c_j^{\beta} \sim q_j'^{\alpha} (cv_j * c_j')^{\beta},$$

$$(8b) \qquad WTA_j \geq N_j * (1 - cv_j) * c_j'.$$

It bears mentioning that using the implicit function rule on (5) when evaluated at equality tells us that both maximum willingness to pay and minimum willingness to accept are increasing with respect to a change in the local tax rate, but that this rate of change differs between the two suggesting, at most, a single point of intersection.

C. Revenue Sharing Agreements

When a zone of potential agreement between the school districts exists because the minimum willingness to accept is less than the maximum willingness to pay, an agreement exists that is welfare-improving to both districts, whereby the non-contributing school district could send some portion of its state formula funding to the contributing district in return for the contributing district's local tax increase.

Rather than allowing for revenue sharing agreements between the districts, however, it is also possible for the districts to instead agree that a district with a local levy be allowed to keep a percentage, θ, of that local revenue outside of the funding formula that is equivalent to any attainable revenue sharing agreement:

$$(9) \qquad \theta = \frac{RSA}{\Delta t_2 N_2 y_2} * \frac{N_1 + N_2}{N_1}$$

Thus, the revenue sharing agreement or θ, if either exists given the parameters of the model, describe a partial equilibrium between the school districts that, while being welfare improving to both districts, may not reflect a stable general equilibrium. Intuitively, both school districts would exhibit a propensity to decrease the state-level tax rate in lieu of additional consumption, but it appears that, even after subsequent adjustments, some point with higher q_i would still be attainable and welfare-improving relative to the pure state system. This paper proposes that the general equilibrium could be evaluated with the following structure:

$$(10a) \qquad q_i = \frac{\tau_S(N_1 y_1 + N_2 y_2) + (1-\theta)(t_1 N_1 y_1 + t_2 N_2 y_2)}{N_1 + N_2} + t_i y_i \theta$$

$$(10b) \qquad c_i = (1 - \tau_S - t_i) y_i$$

Ultimately, this paper chooses not to explore the implications of the potential general equilibrium model. Instead, it proceeds with an evaluation at partial equilibrium, keeping in mind that those results represent an extreme upper bound of potential local effort for education under a highly equalized finance system.

III. QUANTITATIVE RESULTS

A. Parameter Values and Baseline Simulation Results

Based on the functional form outlined above, it is necessary to specify the following parameters: α, β, population shares for each respective school district (N_1 and N_2), and the mean to median income ratio ($\mu/\tilde{y}$). The population share and mean-to-median income ratio define the initial per capita endowment for each respective school district (y_1 and y_2) and the variance of the natural logarithm of income ($ln(y)$).

[Table 1]

The value used for α is the same as the exponential factor applied to educational quality in the Cobb-Douglas utility function used by Ferreyra (2009) in her policy analysis of school finance reform in Michigan. The value for β was set to one minus α. It should be noted that Ferreyra estimated this and other exponents for her functional form using data specific to Michigan, and her functional form allowed that educational quality specified components from educational expenditures as well as peer effects.

Population shares, which necessarily sum to one under a two-district model, were arbitrarily assigned to fulfill to certain conditions under the hybrid system of fully-equalized educational funding solely with revenue from independently-determined local tax rates: first, that the voters in the poorest district would have a lower tax rate under that system than a state system; and second, that a non-negative local tax would prevail for the poorest district.

The mean-to-median income ratio of 1.2 is used from the text of Fernandez and Rogerson (2003), which cites an estimate of the distribution of annual household income of US data. Under a simple two-district model, it is impossible to replicate the variance of that data sample without extremely altering the population shares of the school districts.

[Table 2]

Using the specified parameters, baseline results were obtained for three education finance systems: a local system, a state system, and a hybrid system of fully-equalized educational

funding solely with revenue from independently-determined local tax rates. The table above displays equilibrium values for tax rates, educational expenditures by district and in aggregate, consumption, and two welfare metrics.

Two welfare metrics are included for consideration. The welfare metric, W, quantifies social welfare through the expected value of the natural log of utility under each system, assuming that the placement of each individual within either school district is not known a priori. The range ratio is the difference in per pupil educational expenditures between the richest district and the poorest district divided by the per pupil expenditure of the poorest district.

B. Evaluation of Induced Local Effort

For the purposes of evaluating the potential additional local tax effort generated through a side payment in the form of a revenue sharing agreement between the two school districts, this analysis only considers the state system as a starting point. Under a local system, no feasible agreement could exist, and under the hybrid system, local tax effort is so under-leveraged to begin with as to lead to absurd results.

Two objectives are considered with respect to the form of revenue sharing agreements. The first is maximizing aggregate educational expenditures (Q'), and the second is maximizing the per capita educational expenditures of the poorest district (q_1), which also happens to maximize W under its assumed form.

[Table 3]

Under the constraint that an agreeable outcome to both districts must exist, these objectives could be achieved by the richest district making a donation to the state aid formula funded by a local tax effort of 4.65 percent and 2.41 percent, respectively. Under the scenario of maximizing q_1, the zone of potential agreement is fairly large at approximately 29.3 percent of the richest district's minimum willingness to accept, suggesting that a sustainable agreement could be made that is welfare-improving to the residents of both school districts over the baseline state system.

Determining the terms of the revenue sharing agreement, which would inform how the welfare gains from such an agreement would be distributed, is beyond the scope of this paper. Instead, the analysis arbitrarily focuses on an outcome where the revenue sharing agreement is set at the midpoint between the poorest district's maximum willingness to pay and the richest district's minimum willingness to accept. This point is chosen for two primary reasons: first, the margins of the agreement would allow for some non-trivial transaction cost; and second, if the revenue sharing agreement were specified at either extreme, it becomes a less tenable assumption that a district would enter into an agreement to which it is completely indifferent.

[Table 4]

Under the current model specifications, aggregate educational expenditures will be maximized at a tax rate resulting in a convergence between the maximum willingness to pay and the minimum willingness to accept. The gains to educational expenditure from this objective appear to be distributed to the richest district. This is not surprising because, when θ equals one, the functional form of educational expenditures as a function of local taxes reduces to the iconic

foundation system. Consequently, this objective leads to a sizable increase in disparity of educational expenditures, but considering the objective results in almost nonexistent welfare gains for either district, it does not appear that such an outcome would prevail.

Instead, it is more informative to examine the second objective, maximizing the per pupil educational expenditures of the poorest district. This objective, which could be attained with an increase to the richest district's tax rate of just over half of what would be necessary for the first objective, results in welfare gains to both districts and an increase in the aggregate educational expenditure. Moreover, because of the apportioned gains of per capita education expenditures between districts, the resulting increase in disparity is moderated, though still substantial.

The previous results have considered revenue sharing agreements which keep funds generated through local tax within the educational system. It might be worth considering whether an agreement allowing the transfer of additional educational dollars to the levying district's consumption, rather than education, budget would be more efficient.

[Table 5]

The effects of allowing a transfer from one district's education revenue to the other district's budget for consumption depend largely on where the terms of that agreement have been set. Where the gains from the agreement rest entirely with the non-levying district, leakage from aggregate educational expenditures is minimized. Conversely, terms benefiting the levying district's welfare more result in greater leakages from aggregate educational expenditure to consumption.

Although this could be viewed as a cautionary note, it could be viewed differently when considering alternative functional forms for the underlying model. If a different functional form were specified that resulted in the opposite direction of taxation, meaning the poorest district were induced to tax more by a side payment from the richest district, a transfer payment to the poorest district's consumption could be preferential under certain circumstances since it would still result in some positive change to per capita educational expenditures in that district as well.

III. REVIEW OF EMPIRICAL DATA AND MODEL PREDICTIONS

The simulation predicts that q_1, being the per pupil education expenditure of the poorest district, will be maximized at partial equilibrium by a tax increase in the wealthy district of 2.4 percent with a revenue sharing agreement equivalent to θ between 0.832 and 0.916, which would result in local tax effort accounting for approximately 9.1 percent of total operational revenue. Bearing in mind the limitations of this stylized partial equilibrium model, its results can be compared to data on New Mexico public education finance to get some sense of available capacity to increase local tax effort.

The New Mexico public school funding formula currently allows school districts to levy up to 0.5 mills of property tax for operational purposes. However, a school district's state equalization guarantee is reduced by 75 percent of any revenue generated through its local levy. In terms of the model presented in this paper, this effectively results in a θ of 0.25. It is also worth noting that, prior to 1999, the percentage for reduction of state aid was 95 percent (or θ = 0.05).

[Table 6]

As shown in the table above, local property tax generated only about $19.2 million of operational revenue statewide during the 2013-2014 school year, compared to over $2.42 billion of total operational revenue statewide. The share of local revenue to total revenue is roughly one tenth as much as the partial equilibrium simulation suggests would maximize the per pupil educational expenditure of the poorest district; however, being results from a partial equilibrium model, the simulation likely overstates the share of local revenue to some degree compared to a general equilibrium result.

Another explanation for the lower-than-expected share of local revenue comes from examining the federal revenue sources. Federal revenue from the Impact Aid and Forest Reserve programs contributed an additional $73.9 million to operational revenue for that school year. Similar to local property tax revenue, a school district's state equalization guarantee is also reduced by 75 percent of revenue from those two sources. If those revenues were included as local, the share of "local" revenue would rise to just under 4 percent, which is about four tenths of the capacity predicted by the model, and that is with a θ of 0.25, far below the range of θ between 0.832 and 0.916 yielded by the model.

One explanation for such disparate values of θ between the model results and the empirical data could come from the regulatory structure surrounding a state's ability to take credit for Impact Aid within its state aid formula. Federal law limits a state from crediting a greater percentage of Impact Aid against formula funding than it does for local revenue. Additionally, in order to take any credit at all, a state's finance system must be certified as highly

equalized by the secretary of the US Department of Education. Two implications arise from this fact with respect to how data from New Mexico fits with the model.

First, Impact Aid payments are calculated by the federal government and are therefore not responsive to changes in the percentage credited against the state aid program. This implies that, at some point, the marginal increase to equalized local tax effort from an increase in θ might not offset the marginal decrease in equalized federal funds.

Second, the test for being certified as such is having a federal range ratio, being the difference between per pupil or per educational unit funding at the 95th and 5th percentiles divided by the per pupil or per unit funding at the 5th percentile, below a value of 0.25. Results from the stylized model suggest that values of θ which maximize per capital educational revenue for the poorest district result in dramatic increases to the range ratio approaching 0.20. The current percentage of local revenue taken credit for in the funding formula might reflect the risk that, if it were reduced, the state might lose the ability to take credit for any of the Impact Aid.

The more curious deviation from the model predictions comes from examining the current operational property tax levies of New Mexico school districts. All districts levy this optional tax, and only three districts, including Zuni Public Schools, which has the least property wealth in the state, tax at the maximum allowable mill rate. The lowest tax rate is set by Dulce Independent Schools at 0.033 mills, but the next lowest is Pecos Independent School District at .100 mills. Only 23 out of 89 school districts tax at fewer than .250 mills, or half of the maximum allowable rate.

[Table 7]

The model predicts that a zone of potential agreement to increase equalized local tax effort will exist in only a single direction, resulting in only a single levying district. Ostensibly, this might lead one to expect greater variation in the empirical data than there actually is. Several reasons present themselves as to why this model prediction does not reconcile to the empirical data.

First, the presence of substantial local effort could either indicate a lower-than-desired state tax rate from which local school districts nearly uniformly increase their local effort, or it might indicate an underlying preference for the method of taxation. Over 53 percent of New Mexico's recurring general fund revenue comes from its gross receipts and personal income taxes, and the state is statutorily and constitutionally limited from imposing a property tax for recurring expenditures. It is possible, rather than being due to too low of a state general fund contribution to public education, the extent of current local property tax effort suggests that property tax is an underutilized method of taxation within the basket of potential revenue generators.

Second, the optional mill levy for operational public school funding is considered along with other levies to determine local effort when calculating state matching funds for certain capital outlay projects. In other words, the marginal benefits of exerting additional effort encompass both operational revenue and additional capital funding through the state.

Finally, the stylized model presented in this paper, as many models used in analyses of education finance reform, assumes perfect sorting corresponding to Tiebout's (1956) model of public good provision. With respect to New Mexico, however, this assumption may be far from appropriate because populations of any given school district are likely not as homogeneous in income as the model assumes. In combination with New Mexico having relatively few school

districts, which encompass rather large geographic areas, household location decisions are most likely driven primarily by factors other than school quality and local property tax rates.

Although it is beyond the scope of this paper, the questions and hypotheses raised through the reconciliation of the empirical data to predictions made in the stylized model could be answered by econometrically evaluating local effort in NM public school finance. Over 30 years of data from 89 school districts are available in this pursuit, with approximately 15 years on each side of the legislative change to the percentage by which local revenue was taken credit within the state funding formula.

IV. CONCLUSIONS

Beginning from a stylized model of education finance, this paper has shown that a willingness to pay or accept a marginal increase in the local tax rate of one district to contribute to the state funding formula can be defined, and that bargaining through the form of revenue sharing agreements or a similar mechanism could lead to a partial equilibrium that is welfare-improving to both parties. Furthermore, simulation results based on those findings show that ranges for willingness to pay/accept exist and can be used to achieve at least two different objectives while remaining within a zone of potential agreement.

The resulting induced local tax efforts from the simulation have been evaluated with respect to the impact on aggregate educational expenditures and disparity, with the finding that maximizing the per pupil educational expenditures of the poorest district can be achieved with additional marginal rates of taxation about half as large as would be necessary to maximize aggregate educational expenditures. The tradeoff with this outcome is that, even though the

welfare of households in each district improves, disparity of per pupil educational expenditures will increase.

Comparing the simulation results are compared to empirical data from New Mexico, the paper finds that the partial equilibrium model suggests that, with respect to maximizing the minimum per pupil educational expenditures, New Mexico has lower-than-expected local tax effort as a share of total operational revenue albeit with a much larger percentage by which state aid is reduced with additional local effort. The inconsistencies between the model's predictions and the empirical data can at least partially be explained through the context of the statutory and regulatory structure facing the state, namely originating from the federal Impact Aid program.

One of the inconsistencies between the model's predictions and the empirical data leads to potential policy implications. At the current levels by which state foundation aid is reduced with additional local effort, the model would suggest even less local tax effort than presents itself in the empirical data; this is because the maximum local tax rate that would be levied under the model can be endogenously defined through the percentage of local tax effort credited against state aid. With that understanding, it would be reasonable to question whether it is necessary to impose severe restrictions for both the percentage of local tax effort credited against state aid and the maximum allowable local tax rate. A further study of the interaction between these two policy instruments might inform whether they should be used in tandem or in exclusivity.

Even taking into account the shortcomings of the model and the inconsistency of some of its predictions with the empirical data, because of the current existence of larger-than-expected local effort, it suggests that New Mexico may be able to further increase guaranteed state aid for education, while still ensuring that federal requirements with respect to Impact Aid are met, by relaxing the current limits on local taxation even to a small degree.

Ultimately, in order to more precisely analyze whether the state has further capacity to increase local tax effort for education under its equalization regime, additional complexity may be needed in the model to more accurately reflect the state's characteristics. These modifications to the model include deriving a general equilibrium solution from the functional form proposed earlier, incorporating non-tax sources of educational revenue, expanding the number of school districts covered by the model, and calibrating parameters with data specific to New Mexico.

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DISCLAIMERS

The author is an employee of the New Mexico Legislative Education Study Committee, a bipartisan, bicameral permanent committee of the New Mexico Legislature. The views and opinions expressed in this paper are solely those of the author and do not necessarily reflect the positions of the New Mexico Legislative Education Study Committee, the New Mexico Legislature, or any of its members.

DISCLOSURES

The author has no financial arrangements that might give rise to conflicts of interest with respect to the research reported in this paper.

Table 1
Specification of Parameters Values

Parameter	Value
Utility Function	
α	0.137
β	0.863
Population	
N_1	0.58
N_2	0.42
Income	
$\mu/\tilde{y}$	1.2
y_1	100.00
y_2	147.62
variance of ln(y)	0.0369

Table 2
Baseline Simulation Results by System

	Local	State	Hybrid
Tax Rates			
t_1	0.1370	0.1370	0.0416
t_2	0.1370	0.1370	0.1034
Educational Expenditures			
q_1	13.70	16.44	8.82
q_2	20.22	16.44	8.82
Q	16.44	16.44	8.82
Consumption			
c_1	86.30	86.30	95.84
c_2	127.40	127.40	132.35
Welfare Metrics			
W	4.3693	4.3718	4.3529
Range Ratio	0.476	0.000	0.000

Table 3
Comparison of Willingness-to-Pay and Willingness-to-Accept by Objective

	Maximizing Q'	Maximizing q_1
Δt_2	0.0465	0.0241
CV-deflator$_1$	0.851	0.945
CV-deflator$_2$	1.206	1.059
Maximum WTP$_1$	1.673	0.553
Minimum WTA$_2$	1.673	0.428
Midpoint (WTP$_1$, WTA$_2$)	1.673	0.491

Table 4
Comparison of Additional Local Tax Effort by Objective
(at RSA = Midpoint)

	Baseline	Maximizing Q'	Maximizing q_1
Δt_2	--	0.0465	0.0241
q_1'	16.44	16.44	16.57
q_2'	16.44	23.31	19.83
Q'	16.44	19.32	17.94
$\%\Delta Q$	--	17.54%	9.11%
Range Ratio	0.000	0.418	0.197
Effective θ	--	1	0.916
W	4.3718	4.3718	4.3729

Table 5
Comparison of Transfer Type by RSA when Maximizing q_1

	RSA = Min WTA_2	RSA = Midpoint
Transfer from q_1 to q_2		
Δt_2	0.0241	0.0241
c_1'	86.30	86.30
c_2'	123.83	123.83
q_1'	16.69	16.57
q_2'	19.66	19.83
Q'	17.94	17.94
Effective θ	0.832	0.916
W	4.3730	4.3729
Range Ratio	0.178	0.197
Transfer from q_1 to c_2		
Δt_2	0.0519	0.0519
c_1'	86.30	86.30
c_2'	123.83	124.00
q_1'	16.69	16.57
q_2'	19.66	19.66
Q'	17.94	17.86
W	4.3730	4.3729
Range Ratio	0.178	0.187

Table 6
New Mexico Public School Operational Revenue for 2013-2014 School Year by Source

	Revenue ($thousand)	Share of Total (%)
Revenue from Local Sources	$37,561	1.55
Ad Valorem Taxes – School District	$19,237	0.79
Investment, Rental and Royalty Income	$3,566	0.15
Fees	$5,928	0.24
Other	$8,830	0.36
Revenue from State Sources	$2,289,554	94.48
State Equalization Guarantee	$2,258,401	93.19
Emergency - Supplemental	$8,285	0.34
State Flow-through Grants	$19,296	0.80
Other	$3,573	0.15
Revenue from Federal Sources	$90,180	3.72
Impact Aid, Public Law 103-382	$69,115	2.85
DOE Los Alamos/DOD	$8,122	0.34
Forest Reserve	$4,798	0.20
Other	$8,144	0.34
Other Revenue	$6,047	0.25
Total Operational Revenue	$2,423,343	

Source: NM Public Education Department 2013-2014 Stat Books

Table 7
New Mexico 2013-2014 School District Operational Ad Valorem Taxes
(Mill Rates in $ per $1000 of Taxable Property Value[1])

	Residential	Non-Residential	Copper, Oil & Natural Gas
Number of Levying Districts	89	89	32
Maximum[2] Mill Rate	0.500	0.500	0.500
Minimum Mill Rate	0.033	0.175	0.332
Statewide Average Mill Rate	0.323	0.471	0.491
Standard Deviation	0.104	0.069	0.037

[1]Taxable value is defined as one-third of the assessed valuation.
[2]Operational mill levies are capped at 0.5 mills and subject to yield control.
Source: District tax rates obtained from NM Public Education Department 2013-2014 Stat Books.