

LOCAL GOVERNMENT MODELING

Work Plan

Objective

The objective of the local government modeling effort is to enable the MAP economic model to respond to policy changes affecting the levels of both local government revenues and expenditures.

Several important policy issues related to Alaskan growth fall within the area of local government modeling. The first is the question of the relative revenue generating capacities of the state and local governments. Future petroleum revenues, accruing primarily to the state government, will increase the revenue generating capacity of the state government relative to local government. An often discussed response to this imbalance would be an expansion of the types of programs presently in existence which transfer funds from state to local government--tax sharing, municipal revenue sharing, school foundation grants. A detailed local government model, linked to the state fiscal model, can be used to analyze the effects on state and local finances and financing capabilities of changes in such transfer programs.

Second, the state government has since statehood taken the lead in the provision of government services because of the relative underdevelopment of local government in Alaska. Petroleum development is

providing both the opportunity and the requirement for more local government activity in the provision of services. The development of local government will be in response to factors of growth within the region as well as state transfers of revenues. Recently, the state operated school system which had administered schools in the unorganized borough has been replaced by local school boards, but with continued state financing. This change may well have a profound effect on both the level and distribution of spending on education within the state. The local government model will allow the impact of changes in the level of service to be traced.

Third, in addition to the imbalances which exist between state and local government with regard to the provision of services and revenue generating capacity which will be exacerbated by rapid petroleum development within the state, petroleum development is exacerbating regional differences in the need for government services and the ability of the region to provide for those services, both in terms of revenues, and in terms of administrative and technical capabilities. Any program which transfers resources from the state level to local government will have distribution implications, but the distribution of transfer payments and services is being explicitly considered in such programs as the Pipeline Impact Assistance grants to communities distributed during the preceding fiscal year. The recently approved Federal OCS Impact Grant program will be administered by the state government, providing loans and grants to local communities

on the basis of "need" generated by OCS development. A well-specified local government model will provide the first approximation of "need" based upon the relative fiscal responses of regions to different levels of development. The effects of policies at the state level specifically designed for regional redistribution can be traced out using such a model.

Data Sources

Primary data sources are the annual financial reports of Alaskan communities. These will be supplemented with state annual financial reports and Department of Commerce data from the Census of Governments.

Methodology

Modeling will proceed region by region since each must be treated individually because of both different structure and data availability. Work has commenced on the Anchorage region because it is the largest and has the most accessible data. Each regional model will have four component parts--revenues, expenditures, output, and performance. A local government model for the state model will not be constructed prior to the regional model because it is envisioned that this will be built upon the experience gained, if not the data itself, from the development of the regional models. The models will be built independent of the existing regional model and integrated upon completion.

Proposed Model for Anchorage Region

The model presented in this section is proposed for the Anchorage region (region #5 in the MAP scheme). The necessary data for model construction is presently being collated so the equations have not been tested for plausibility. A stochastic relationship, which will be determined by regression analysis, is indicated by the presence of coefficients such as C5RL1A in the first equation.

1. revenue component

The variables are as follows:

RTPL5	property tax revenues
RUTL5	revenues (in lieu of tax payments, etc.) from utilities
RMCL5	miscellaneous revenues from local sources
R9LL5	total revenues from local sources
RFL5	operating revenues from federal government
RTSL5	shared taxes from state
RRSL5	municipal revenue sharing from state
RFSL5	school foundation program transfers from state
ROOSL5	other education transfers from state
ROSL5	other transfers from state
R9SL5	total revenues from state
R99L5	total revenues
RBOL5	bond sales
GR	statewide gross receipts
AVP5	assessed value of property
WSPIR5	regional wages and salaries
WSPUR5	regional utility industry wages and salaries
WS99	statewide wages and salaries
POP5	regional population
POP	state population
E99S	state government expenditures
ADM5	average daily membership, public schools in region
ADM	average daily membership, public schools in state

The equations are:

Property tax revenues, utility revenues, and miscellaneous revenues are a function of local economic activity. (At present, Anchorage has no sales tax). C5RL2B is the effective property tax rate.

$$\ln(\text{AVP5}) = \text{C5RL1A} + \text{C5RL1B} * \ln(\text{WSPIR5})$$

$$\text{RTPL5} = \text{C5RL2A} + \text{C5RL2B} * \text{AVP5}$$

$$\ln(\text{RUTL5}) = \text{C5RL3A} + \text{C5RL3B} * \ln(\text{WSPUR5})$$

$$\ln(\text{RMCL5}) = \text{C5RL4A} + \text{C5RL4B} * \ln(\text{WSPIR5})$$

$$\text{R9LL5} = \text{RTPL5} + \text{RUTL5} + \text{RMCL5}$$

Transfers from state government depend upon local and state conditions. Foundation program transfers and municipal revenue sharing partially and shared taxes completely depend upon the regional economy. Non-foundation education transfers and other transfers depend upon state finances. IURAT is the function which translates public school membership into instructional units and IUPAY is the statutory transfer based upon the "basic need" requirement per instructional unit. RSRATE is the statutory municipal revenue sharing rate.

$$\text{RTSL5} = \text{C5RL5A} + \text{C5RL5B} * \text{GR} * (\text{WSPIR5}/\text{WS99})$$

$$\text{ADM5} = \text{ADM} * \text{POP5}/\text{POP}$$

$$\text{RFSL5} = \text{ADM5} * \text{IURAT} * \text{IUPAY}$$

$$\ln(\text{ROOSL5}) = \text{C5RL6A} + \text{C5RL6B} * \ln(\text{E99S})$$

$$RRSL5 = RSRATE * POP5(-1)$$

$$\ln(ROSL5) = C5RL7A + C5RL7B * \ln(E99S)$$

$$R9SL5 = RTSL5 + RRSL5 + RFSL5 + ROOSL5 + ROSL5$$

RFL5 exogenous

$$R99L5 = R9LL5 + R9SL5 + RFL5$$

$$\ln(RBOL5) = C5RL8A + C5RL8B * \ln(WSPIR5)$$

2. expenditure component

The variables are as follows:

EED8L5	education expenditures from own sources
EEDL5	total education expenditures
EGGL5	general government expenditures
EP5L5	public safety expenditures
EDB5L5	debt service expenditures
EOTL5	other local expenditures
E99L5	total local expenditures for current account
ECAPL5	capital expenditures
RFCAPL5	federal capital transfers to local government
BONDL5	bonded indebtedness

The equations are:

Education is determined by local revenues and grants. Other expenditure levels are determined by local revenues. Debt service depends upon outstanding bonds and the average cost of debt service.

as a percentage, CRF. RET is the percentage of bonds annually retired.

$$\ln(\text{EED8L5}) = \text{C5EL1A} + \text{C5EL1B} * \ln(\text{R9LL5}) + \text{CREL1C} * \ln(\text{ROOSL5})$$

$$\text{EEDL5}' = \text{EED8L5} + \text{RFSL5} + \text{ROOSL5}$$

$$\ln(\text{EGGL5}') = \text{C5EL2A} + \text{C5EL2B} * \ln(\text{R9LL5})$$

$$\ln(\text{EPSL5}') = \text{C5EL3A} + \text{C5EL3B} * \ln(\text{R9LL5})$$

$$\ln(\text{EOTL5}') = \text{C5EL4A} + \text{C5EL4B} * \ln(\text{R9LL5})$$

$$\text{EDBSL5} = \text{CRF} * ((1-\text{RET}) * \text{BONDL5}(-1) + \text{RBOL5})$$

$$\text{E8L5}' = \text{EEDL5}' + \text{EPSL5}' + \text{EOTL5}' + \text{EGGL5}'$$

$$\text{E8L5} = \text{R99L5} - \text{EDBSL5}$$

$$\text{EEDL5} = \text{EEDL5}' * (\text{E8L5}/\text{E8L5}')$$

$$\text{EGGL5} = \text{EGGL5}' * (\text{E8L5}/\text{E8L5}')$$

$$\text{EPSL5} = \text{EPSL5}' * (\text{E8L5}/\text{E8L5}')$$

$$\text{EOTL5} = \text{EOTL5}' * (\text{E8L5}/\text{E8L5}')$$

$$\text{E99L5} = \text{EDBSL5} + \text{EEDL5} + \text{EGGL5} + \text{EPSL5} + \text{EOTL5}$$

$$\ln(\text{ECAPL5}) = \text{C5EL5A} + \text{C5EL5B} * \ln(\text{RBOL5} + \text{RFCAPL5})$$

3. output component

The variables are as follows:

WSGAL5	local government wages and salaries
WRGAL5	local government wage rate
WEUS	U.S. average weekly earnings
EMGAL5	local government employment
XXGAL5	local government gross product

The equations are:

$$\ln(\text{WSGAL5}) = \text{C5L1A} + \text{C5L1B} * \ln(\text{E99L5})$$

$$\ln(\text{WRGAL5}) = \text{C5L2A} + \text{C5L2B} * \ln(\text{WEUS})$$

$$\text{EMGAL5} = \frac{\text{WSGAL5}}{\text{WRGAL5}}$$

$$\ln(\text{XXGAL5}) = \text{C5L3A} + \text{C5L3B} * \ln(\text{EMGAL5})$$

(State government output for the region must also be recalculated, but the specification of equations does not change from the present.)

4. performance component

The variables are as follows:

AVP5PC	assessed value per capita
BONDL5PC	bonded debt per capita
BOAV5	ratio of bonded debt to assessed value
IPDSL	implicit price deflator, state and local government
E8L5	non-education, non-debt service expenditures
ECOMPL5	average employee compensation, local government

The equations are:

Performance is measured by real expenditure levels and by bonded indebtedness. Additional measures of revenue performance will be developed for direct comparison among the regions.

$$\text{ECOMPL5} = \text{ECOMRAT} * \text{WRGAL5}$$

$$\text{IPDSL} = \text{C5P1A} + \text{C5P1B} * \text{ECOMPL5}$$

$$\text{E8L5} = \text{E99L5} - \text{EEDL5} - \text{EDBSL5}$$

$$\text{E8RL5} = \text{E8L5}/\text{IPDSL}$$

$$\text{E8RLPC5} = \text{E8RL5}/\text{POP5}$$

$$\text{E8RLPI5} = \text{E8RL5}/\text{WSPIR5}$$

$$\text{AVP5PC} = \text{AVP5}/\text{POP}$$

$$\text{BONDL5PC} = \text{BONDL5}/\text{POP}$$

$$\text{BOAV5} = \text{BONDL5}/\text{AVP5}$$

Timetable

Work is presently underway to collate the data for Anchorage. Fairbanks data has also been collected and will be the second to be modeled. After these two regions, the work becomes more difficult because of the number of communities and their small individual size.

The remainder of year 1 and a portion of year 2 will be required for the collection of data for the smaller regions and the completion

of all the regional models. The remainder of year 2 would be used for model testing within the full MAP model and preliminary simulations. The third year will be reserved for policy analysis.