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MAP Working Paper

Local Government Fiscal Component of

MAP Statewide Model

(LOCMOD9)

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This paper describes the structure of a preliminary version of a local government fiscal component of the MAP statewide model. The integrated model, called LOCMOD9, was developed using REVMOD9 as the base. Variables developed for model use are included in the REVMOD file. A sample run dset, LOCAL9.2, is on file in Seiver. Further work is contemplated to reduce the required simulation time.

REVENUES

1. property tax

Seven equations make up the local property tax component. The local property tax base (LPTB) is composed of an endogenous portion (LPTB1) based on personal income and an exogenous portion based on petroleum property (PTBP9) within local jurisdiction (LPTBP9). This will link to the scenario model in the future. Property tax receipts (RTPL) are calculated as the tax base multiplied by the effective rate.

```
140: LOG(LPTB1) = CPTBL1+CPTBL3*PBDUM+CPTBL2*LOG(FI(-1))
142: LPTBP9 == P9PTPER*PTBP9
143: LPTB == LPTB1+LPTBP9
144: RTPL = CRFTL1+CRFTL2*LPTB
```

In addition, the state government makes use of property tax values in allocating funds to locals under the education foundation program. The state adjusts property tax values to "full value" (LPTB1FV) using an annual sample. The ratio has remained fairly constant over time. The total full value of personal property in local jurisdictions (LPTBFV) is this "full value" plus petroleum property in local jurisdiction. Total personal property in the state (PPVAL) is the full value of local non-petroleum property plus all petroleum property.

```
141:      LPTB1FV == LPTB1*1/LVFV
144:      LPTBFV == LPTB1FV+LPTBP9
145:      PPVAL == LPTB1FV+PTBP9
```

2. other taxes

These are determined as previously.

$$RTOL*1000/POP(-1) = C31A+C31B*LOG(FI(-1)*1000/POP(-1))$$

$$*1000/(RPI*POP(-1)) = (1+GLMRAT)*RMCL(-1)*1000/(RPI(-1)*POP(-2))$$

3. state-local transfers

a. tax sharing

Business license shared taxes (RTBLLT), electric and telephone coop taxes (RTVSLT), and other shared taxes (RTOTLT) (consisting of

amusement licenses, aviation fuel taxes, liquor licenses, and fisheries taxes) are all tied to their state bases. They are summed (RTSLT).

149: RTBLLT = CRSL1A+CRSL1B*RTBS

150: RTVSLT = CRSL2A+CRSL2B*RTVS

151: RTOTLT = 0.4*RTOTS

152: RTSLT = RTBLLT+RTVSLT+RTOTLT

b. revenue sharing

State-local revenue sharing is based upon a series of per capita dollar amounts available to local government based upon the local provision of services, and other amounts keyed to numbers of facilities. These are summarized in two equations. In the first, one component of revenue sharing (RTSLRS1) is calculated on the basis of population and the per capita revenue sharing allotment for all payments made on that basis (REVSHART). In the second, the total revenue sharing (RTSLRS) is the sum of this component and an exogenous component (RTSLRSX) composed of road and health facility aid allotted on the basis of facilities rather than population.

153: RTSLRS1 = CRSL4A+CRSL4B*^{RVSHART}REVSHART*POPC

154: RTSLRS = RTSLRS1+RTSLRSX

c. miscellaneous transfers

These are calculated by a simple growth rate, GRSLT.

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155:      RTSLMS = IF YR GT 1974 THEN RTSLMS(-1)*(1+GRSLT) ELSE 27.309
```

d. education transfers

Thirteen equations are used to calculate education transfers from the state to local government (RTSLED). Since a large percentage of these transfers is handled through the Foundation program which is keyed to attendance, the average daily membership in district, state operated (now Rural Education Attendance Area (REAA)) and military schools is calculated. (ADMD, ADMS, ADMB) The total of these average daily membership components (ADM96) plus the exogenously determined value of the "basic instructional unit" (BIU) determine the level of transfers to local government under the foundation program (RTSLEDF).

```
156:      ADMD = CADM1*POP519
157:      ADMS = CADM2*POP519
158:      ADMB = CADM3*DFMIL
159:      ADM96 == ADMD+ADMS+ADMB
161:      RTSLEDF = CRSL6A+PEDUM*CRSL6B+BIU*CRSL6C*ADM96+CRSL6D*ADM96
```

Transfers from cigarette taxes (RTSLEDC) are simply a fixed percentage of taxes at the state level. Transfers for pupil transportation (RTSLEDTR) are a function of population. Other education transfers for

public schools (RTSLEDOT) are determined by an exogenously set growth rate, GREDOT.

```

160:      RTSLEDC == 0.625*RTSLEDOT
162:      LOG(RTSLEDOT) = CRSL7A+CRSL7B*LOG(POP(-1))
163:      RTSLEDOT = IF YR GT 1976 THEN RTSLEDOT(-1)*(1+GREDOT) ELSE
                (IF YR EQ 1976 THEN 24.923 (ELSE IF YR GT 1975 THEN 11.693 ELSE 9.357))

```

Transfers to fund the REAAs (RTSLEDS\$) are calculated on the basis of average expenditures in the previous year in the school system at the local level (AVEFEDL).

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164:      RTSLEDS$ == IF YR GT 1976 THEN AVEFEDL(-1)*(ADMS+ADMB) ELSE 0
177:      AVEFEDL = (EEDL-RTSLED1-RFDL)/ADM96

```

Transfers to local schools for debt service (RTSLEDD\$) form the final component of primary and secondary education transfer (RTSLED1) and are exogenously set. Non-primary and non-secondary education transfers for education (RTSLED2) grow at an exogenously determined rate, GRED2.

```

165:      RTSLED1 == RTSLEDC+RTSLEDF+RTSLEDTR+RTSLEDOT+RTSLEDS$+RTSLEDD$
166:      RTSLED2 = RTSLED2(-1)*(1+GRED2)
167:      RTSLED = RTSLED1+RTSLED2

```

Total transfers (RTSL) are the sum of tax sharing, revenue sharing, education and miscellaneous programs as well as exogenous petroleum related revenue sharing (RTSLP9X) and exogenous other revenue sharing (RSTLX).

168: RTSL == RTSLT+RTSLRS+RTSLED+RTSLMS+RTSLP9X+RSTLX

4. total revenues

This (R99L) is the sum of the other components in addition to federal-local transfers (RFDL) which are exogenous.

EXPENDITURES

Local expenditure data being what it is, it continues to be impossible at the state level to develop reasonable equations for expenditures by function, except for education and debt service.

1. education

Locally generated education expenditures (EEDL98) are a function of personal income per capita. This plus state transfers (RTSLED) combine to form total local education expenditures (EEDL). The capital component for education can be broken out (EEDLCP) and this is all expenditures which result in equipment purchase with a life in excess of one year.

170: EEDL98 = EXL1A+EXL1B*(PI(-1)/POP(-1))

171: EEDL == RTSLED+EEDL98

172: EEDLCP = EXL2A+EXL2B*EEDL

2. non-education

Debt service requirements (EDBL) are based upon general obligation bonds outstanding (GOBONDL). General obligation bonds grow at an exogenous rate, GRBONDL.

```
174:      EDBL = CEXL1+CEXL2*GOBONDL(-1)
182:      GOBONDL = IF YR GT 1976 THEN GOBONDL(-1)*(1+GRBONDL) ELSE
              (IF YR EQ 1976 THEN 420.808 ELSE (IF YR GT 1975 THEN 351.421 ELSE 312.195) )
```

Other expenditures (ENEL1) grow with population and per capita income growth.

```
173:      ENEL1/POP(-1) = EXL3A+EXL3B*(FI(-1)/POP(-1))+EXL3E*PBDM*(FI(-1)/POP(-1))
```

Total expenditures (E99L) are the sum of education, debt service, and other; and non-education expenditures (ENEL) are also calculated.

```
175:      E99L == EEDL+ENEL1+EDBL
176:      ENEL == E99L-EEDL
```

MISCELLANEOUS

The local government wage bill (WSGL) is calculated from personnel expenditures (EPERSL). This, in turn, is a function of total expenditures, minus local capital expenditures for education.

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178:      EPERSL = CEXL2A+CEXL2B*(E99L-EEDLCP)
179:      WSGL = CEXL3A+CEXL3B*EPERSL
```

Utility expenditures (EUTL) are a function of population and personal income. Revenues (RUTL) are related to expenditures.

```
180:      LOG(EUTL/POP) = EXL9A+EXL9B*LOG(PI(-1)/POP(-1))
181:      RUTL = CRSL9A+CRSL9B*EUTL
```

Since local expenditures are not a strict function of revenues in this model, a theoretical surplus or deficit can accumulate in local treasuries. In reality, this would be balanced by altering the property tax rate to balance the local budget. The surplus or deficit (SRTAXL) is the difference between local expenditures (E99L) (funded from all sources) and the sum of revenues (R99L) and new bond sales (GOBONDL - GOBONDL(-1)). If SRTAXL is positive (negative), expenditures exceed (are less than) revenues and a short run increase (reduction) in the property tax rate is necessary to balance the budget. This rate (SRTAXLR) is simply the tax requirement divided by the tax base. A cumulative total of surtax amounts is also calculated (SRTAXL9).

```
183:      SRTAXL == E99L-R99L-(GOBONDL-GOBONDL(-1))
184:      SRTAXLR == SRTAXL/LFTE
185:      SRTAXL9 = SRTAXL9(-1)+SRTAXL
```

RELATED MODEL CHANGES

The incorporation of the local government model into REVMOD9 required two changes in other REVMOD9 model components.

Since local government wages and salaries is determined by local government personnel expenditures, the following equation is eliminated:

$$\log(\text{WSGL}) = \text{C91A} + \text{C91B} * \log(\text{EXNCL})$$

Most state-local transfers are accounted for within the two state functional categories of education and commerce and economic development. One can thus define state expenditures in these categories net of transfers (EEDSNT and ECDSNT). It is the net state expenditures in these categories which, in turn, serve to determine state expenditures for personnel in education (PEREDS98), net of the University of Alaska and in commerce and economic development (PERCDS).

```

101:      EEDSNT == EEDS-RTSLED
108:      ECDSNT == ECDS-RTSLT-RTSLRS
113:      PEREDS98 = PE1A+PE1B*EEDSNT+PE1C*PE1D
118:      PERCDS = PE7A+PE7B*ECDSNT

```