

II. Fairfax County

Fairfax County is a suburban and urban county in northern Virginia in close proximity to Washington, D.C. It is a moderately high fiscal capacity ($LCI_{1996-98} = 0.7235$) school division. Fairfax County is typical of many suburban jurisdictions in the Commonwealth exhibiting faster than average change to its relatively large indicator bases. At approximately 132,000 pupils in 1994 the Fairfax Public Schools has the highest average daily membership in the state comprising approximately 13% of the state ADM. Its ADM and Population Biennial Change Rates have mirrored the State at times and deviated from the State at other times.

Local to State Ratio Net Biennial Change Rate.

$(TPV/ADM)_{Fairfax} / (TPV/ADM)_{State}$ (Table 4.21)

The State Net Biennial Change Rate dampened Local to State Ratio, either incompletely (Periods II, III, and IV) or completely (Periods I and V), the corresponding Local Net Biennial Change Rate.¹⁰⁵ Similar to the low fiscal capacity localities the degree of dampening in Period I was miniscule (-0.524%). Periods II-IV exhibited Local Net Biennial Change Rates ranging from approximately 20.5% to 51.7% for TPV/ADM. However, these percentages were much larger than the corresponding State rates, thus producing the positive differences observed in their Local to State Ratios. For Period V the Local Net Biennial Change Rate slowed to less than one percent (0.883%), which was smaller than the State Net Biennial Change Rate (5.621%). Thus, the Local to State Ratio was completely dampened to a lower value.

The $TPV_{Fairfax}$ indicator value increased for every Period, except the sixth in which it exhibited a -6.885% Net Biennial Change Rate.¹⁰⁶ In Period VI the decreased Indicator value coupled with a loss (-2.436%) in $ADM_{Fairfax}$ produced a negative Local Net Biennial Change Rate (-9.321%). The Local to State Ratio Net Biennial Change Rate was dampened completely, because the negative Local Net Biennial Change Rate that was lower than that of the State (-1.662%).¹⁰⁷ The direction of the dampening effect for this Period was the opposite of the dampening effect (or *positive*, dampening the negative change toward the State Mean) for previous Periods. This positive effect tended to

¹⁰⁵ Note that the pattern of incomplete or complete dampening was exactly the opposite to that of Carroll County and Buena Vista City. For Fairfax County there was no single Period that exhibited an enhanced volatility type in the Local to State Ratio.

¹⁰⁶ Refer to the appropriate section in Volume II: Technical Appendix for these percentages.

¹⁰⁷ Refer to the appropriate sections in Volume II: Technical Appendix of this study.

dampen the "loss" in the Local Standardized Indicator. Further, the steadily increasing ADM always contributed to the dampening of the growth in the Local Indicator *within* the Local Net Biennial Change Rate for Fairfax County. The volatility type (G4) for Fairfax County for Period VI was unusual compared with the most school divisions in the Commonwealth. For many other school divisions the negative State Net Biennial Change Rate was smaller (more negative) than their corresponding Local Net Biennial Change Rate, which had the effect of *enhancing* rather than dampening the magnitude of local change in their Local to State Ratio value.

(TPV/POP)_{Fairfax} / (TPV/POP)_{State} (Table 4.22)

The TPV/POP Local to State Ratio exhibited a variable Net Biennial Change Rate. Similar to the TPV/ADM_{Fairfax} the POP component exhibited a dampened volatility pattern. For each Period the State Net Biennial Change Rate dampened, either completely (Periods I, V, and VI) or incompletely (Periods II, III, and IV), the magnitude of the Local change rate. The degree of dampening in Period I was the smallest (-0.0379%). Periods II-IV exhibited the typical incomplete dampening volatility pattern for faster than average growing localities. However, in the fifth Period (when the State Net Biennial Change Rate dropped to 5.755% - partly due to the sharp increase in ADM_{State}) the dampening became complete. Thus, the Local to State Ratio decreased (-0.1229%). In Period VI the Local Net Biennial Change Rate was more negative (-10.871%) than the corresponding State rate (-2.169%). Therefore, although the Local to State Ratio decreased for this Period, this decrease was dampened in the *positive* direction toward the State Mean value, also.

TABLE 4.21. (TPV/ADM)_{Fairfax} Local to State Ratio Net Biennial Change Rate, Difference, and Volatility, Biennia 1984-86 through 1996-98

Period	Local Net Biennial Change Rate (Percentage)	-	State Net Biennial Change Rate (Percentage)	=	Local to State Ratio Net Biennial Change Rate (Percentage)	Difference in the Local to State Ratio	Volatility Type ¹
I 84-86 to 86-88	14.660	-	15.183	=	-0.524	-0.0075	Type B3
II 86-88 to 88-90	20.573	-	16.453	=	4.120	0.0588	Type A2
III 88-90 to 90-92	42.548	-	31.503	=	11.045	0.1642	Type A2
IV 90-92 to 92-94	51.722	-	37.012	=	14.711	0.2429	Type A2
V 92-94 to 94-96	0.883	-	5.621	=	-4.738	-0.0898	Type B2
VI 94-96 to 96-98	-9.321	-	-1.662	=	-7.659	-0.1382	Type G4

¹Refer to Appendix C in this volume and the appropriate section in Volume II: Technical Appendix.

TABLE 4.22. (TPV/POP)_{Fairfax} Local to State Ratio Net Biennial Change Rate, Difference, and Volatility, Biennia 1984-86 through 1996-98

Period	Local Net Biennial Change Rate (Percentage)	-	State Net Biennial Change Rate (Percentage)	=	Local to State Ratio Net Biennial Change Rate (Percentage)	Difference in the Local to State Ratio	Volatility Type ¹
I 84-86 to 86-88	7.306	-	9.744	=	-2.438	-0.0379	Type B2
II 86-88 to 88-90	17.186	-	13.560	=	3.627	0.0550	Type A2
III 88-90 to 90-92	35.078	-	27.211	=	7.867	0.1236	Type A2
IV 90-92 to 92-94	40.681	-	31.380	=	9.301	0.1576	Type A2
V 92-94 to 94-96	-0.881	-	5.755	=	-6.636	-0.1229	Type F2
VI 94-96 to 96-98	-10.871	-	-2.169	=	-8.702	-0.1505	Type G4

¹Refer to Appendix C in this volume and the appropriate section in Volume II: Technical Appendix.

(AGI/ADM)_{Fairfax} / (AGI/ADM)_{State} (Table 4.23)

The AGI/ADM Local to State Ratio exhibited increases in its Net Biennial Change Rate. For every Period the State Net Biennial Change Rate incompletely dampened the magnitude of the Local Net Biennial Change Rate. Fairfax County always exhibited Local Net Biennial Change Rates that were higher than the corresponding State rates, although its Local Net Biennial Change Rates declined from a high of 25.7% (Period III) to 9.2% (Period VI).

(AGI/POP)_{Fairfax} / (AGI/POP)_{State} (Table 4.24)

The AGI/POP Local to State Ratio exhibited a more variable trend than that of the AGI/ADM discussed above. One major difference was the occurrence of complete (Periods II, III, and V) in addition to incomplete dampening (Periods I, IV, and VI) of the Local Net Biennial Change Rate. The reason for this variation from the ADM component is that Periods I, IV, and VI experienced either population loss or less than one-half of one percent in population change rates. As noted earlier, rapidly increasing standardization units tend to dampen the indicator (TPV) change rate by dividing increases in the Indicator by a greater number of persons. In such a case, as when the standardization unit change rate becomes negative or approximates zero, there is an increase in the Indicator divided among fewer persons or a greater value for the Local Standardized Indicator. In these Periods in which the Local Net Biennial Change Rate becomes enhanced due to population loss (which never occurred in the State), the State Biennial Change Rate fails to fully compensate the Local rate. Thus, incomplete dampening results. Thus, even in a locality as dominant and large¹⁰⁸ as Fairfax County deviation from the State Net Biennial Change Rate via aberrant local behavior has the potential to increase the volatility of the Local to State Rate.

¹⁰⁸ Fairfax County may be considered "dominant," because it is the largest school division comprising 21.7% of the Adjusted Gross Income and 13.4% of the Population in the Commonwealth for the 1996-98 Biennium. These percentages are essentially the "contribution" that Fairfax County provides to the State or denominator portion of the Local to State Ratio.

TABLE 4.23. (AGI/ADM)_{Fairfax} Local to State Ratio Net Biennial Change Rate, Difference, and Volatility, Biennia 1984-86 through 1996-98

Period	Local Net Biennial Change Rate (Percentage)	-	State Net Biennial Change Rate (Percentage)	=	Local to State Ratio Net Biennial Change Rate (Percentage)	Difference in the Local to State Ratio	Volatility Type ¹
I 84-86 to 86-88	21.260	-	19.632	=	1.367	0.0194	Type A3
II 86-88 to 88-90	21.856	-	19.092	=	2.321	0.0335	Type A2
III 88-90 to 90-92	25.709	-	20.442	=	4.372	0.0645	Type A2
IV 90-92 to 92-94	11.443	-	9.732	=	1.559	0.0240	Type A2
V 92-94 to 94-96	12.414	-	4.318	=	7.658	0.1197	Type A2
VI 94-96 to 96-98	9.280	-	8.476	=	0.741	0.0125	Type A2

¹Refer to Appendix C in this volume and the appropriate section in Volume II: Technical Appendix.

TABLE 4.24. (AGI/POP)_{Fairfax} Local to State Ratio Net Biennial Change Rate, Difference, and Volatility, Biennia 1984-86 through 1996-98

Period	Local Net Biennial Change Rate (Percentage)	-	State Net Biennial Change Rate (Percentage)	=	Local to State Ratio Net Biennial Change Rate (Percentage)	Difference in the Local to State Ratio	Volatility Type ¹
I 84-86 to 86-88	13.490	-	14.073	=	-0.583	-0.0090	Type B2
II 86-88 to 88-90	18.434	-	16.598	=	1.836	0.0281	Type A2
III 88-90 to 90-92	19.121	-	17.736	=	1.385	0.0216	Type A2
IV 90-92 to 92-94	3.333	-	6.564	=	-3.231	-0.0510	Type B2
V 92-94 to 94-96	10.449	-	4.936	=	5.513	0.0843	Type A2
VI 94-96 to 96-98	7.413	-	7.810	=	-0.397	-0.1259	Type B2

¹Refer to Appendix C in this volume and the appropriate section in Volume II: Technical Appendix.

(TRS/ADM)_{Fairfax} / (TRS/ADM)_{State} (Table 4.25)

For five Periods (I, II, II, IV, and VI) State Net Biennial Change Rate dampened incompletely the Local to State Ratio. The exception to this general volatility pattern occurred in the fifth Period, which exhibited complete dampening and a decrease in its Local to State Ratio (Volatility Type H2). The decrease in the Local Net Biennial Change Rate was due to an unusual situation in which the growth in the TRS_{Fairfax} Indicator declined to an extremely small Biennial Change Rate. Meanwhile, the ADM_{Fairfax} exhibited a higher 6.3% Biennial Change Rate.¹⁰⁹ This phenomenon produced a smaller Local Net Biennial Change Rate for (TRS/ADM)_{Fairfax}. Simultaneously, the ADM_{State} grew at a faster rate than the TRS_{State}. Thus, upon evaluation the local portion of the Local to State Ratio exhibited a smaller Net Biennial Change Rate (-2.962%) than the State or denominator portion (-1.453%). This situation contributed to a decrease (synthetic, in that neither the Local nor the State TRS Indicator decreased) in the Local to State Net Biennial Change Rate. In conclusion, this case illustrates how a larger synthetic change in the State rate can completely dampen the Local Net Biennial Change Rate.

(TRS/POP)_{Fairfax} / (TRS/POP)_{State} (Table 4.26)

For four Periods (I - IV) Fairfax County's volatility pattern was similar to that for the corresponding TRS/ADM Periods as discussed above. Period V exhibited complete synthetic dampening (F2) of its Local to State Ratio. Period VI exhibited complete synthetic dampening.

¹⁰⁹ Refer to the appropriate section in Volume II: Technical Appendix for an analyses of this indicator.

TABLE 4.25. (TRS/ADM)_{Fairfax} Local to State Ratio Net Biennial Change Rate, Difference, and Volatility, Biennia 1984-86 through 1996-98

Period	Local Net Biennial Change Rate (Percentage)	-	State Net Biennial Change Rate (Percentage)	=	Local to State Ratio Net Biennial Change Rate (Percentage)	Difference in the Local to State Ratio	Volatility Type ¹
I 84-86 to 86-88	27.737	-	21.730	=	6.007	0.0597	Type A3
II 86-88 to 88-90	31.919	-	28.320	=	3.599	0.0379	Type A2
III 88-90 to 90-92	22.393	-	17.428	=	4.965	0.0542	Type A2
IV 90-92 to 92-94	18.226	-	10.199	=	8.027	0.0919	Type A1
V 92-94 to 94-96	-2.962	-	-1.453	=	-1.509	-0.0187	Type H2
VI 94-96 to 96-98	13.678	-	10.843	=	2.835	0.0345	Type A2

¹Refer to Appendix C in this volume and the appropriate section in Volume II: Technical Appendix.

TABLE 4.26. (TRS/POP)_{Fairfax} Local to State Ratio Net Biennial Change Rate, Difference, and Volatility, Biennia 1984-86 through 1996-98

Period	Local Net Biennial Change Rate (Percentage)	-	State Net Biennial Change Rate (Percentage)	=	Local to State Ratio Net Biennial Change Rate (Percentage)	Difference in the Local to State Ratio	Volatility Type ¹
I 84-86 to 86-88	19.545	-	15.577	=	3.968	0.0427	Type A2
II 86-88 to 88-90	28.214	-	25.106	=	3.108	0.0347	Type A1
III 88-90 to 90-92	15.979	-	14.019	=	1.960	0.0226	Type A1
IV 90-92 to 92-94	9.623	-	6.690	=	2.932	0.0345	Type A1
V 92-94 to 94-96	-4.658	-	-1.187	=	-3.471	-0.0420	Type F2
VI 94-96 to 96-98	11.735	-	10.062	=	1.673	0.0195	Type J1

¹Refer to Appendix C in this volume and the appropriate section in Volume II: Technical Appendix.

Local Composite Index Net Biennial Change Rate. (Table 4.27)

The Fairfax County Local Composite Index¹¹⁰ value exhibited three change trends as shown in Table 4.27. The relationship of the trends in the LCI will be related to the volatility patterns observed for Fairfax County. For Period I the Local and State factor percentages indicated that the change in the LCI was attributable almost equally to both entities, a characteristic of Balanced Change.

Divergent Change appeared to occur in three Periods (II, III, and IV) in which the LCI increased 3.262%, 6.821%, and 10.031%, respectively. In each of these Periods the Local to State Ratio exhibited the A2: incomplete dampening type of volatility. Thus, although each Local to State Ratio experienced dampening, because it was incomplete in nature, the net effect on the LCI was one of increase.

In the final Periods (V and VI) the LCI decreased 2.166% and 5.032%, respectively. These declines were consistent with a Convergent Change trend, whereby high fiscal capacity localities experienced decreases in their LCI values. Specifically, in the fifth Period the TRS/ADM and TRS/POP Local to State Ratios exhibited complete synthetic dampening (F2 and H2) Net Biennial Change Rates.¹¹¹ The TPV and AGI Local to State Ratios experienced true dampening (completely for the TPV and incompletely for AGI) Net Biennial Change Rates. This dampening contributed to 0.0187 point decline in the LCI value for Fairfax County experienced in Period V.

Contrasted with the Period II - 1986-88 through 1988-90 Biennia the LCI Change for Period VI presents a very different phenomenon. In Period VI the TPV Local to State Ratios exhibited complete dampening (G4), whereas the AGI and TRS Local to State Ratios experienced incomplete dampening (A2 and J1). Note that although the Local AGI/POP decreased, the State AGI/POP dampened this decline incompletely; in other words, breaking its fall. As shown in Figure 4.29 the Net LCI Change appears to be largely due to the Local declines in the TPV/ADM and TPV/POP, which were only modestly dampened by the State.

¹¹⁰ The Local Composite Index is the weighted sum of the Local to State Ratios. Recall that each Local to State Ratio is composed of the sum of the Local Net Biennial Change and the State Net Biennial Change.

¹¹¹ Refer to the appropriate section in Volume II: Technical Appendix for an explanation regarding this form of synthetic dampening.

TABLE 4.27. Local Composite Index Values, Net Biennial Change Rate, and Local and State Percentages, Fairfax County, 1984-86 through 1996-98 Biennia

Period	LCI _{initial}	LCI _{final}	Net LCI Biennial Change Rate		Percentage of Change Attributable to Local Factors	Percentage of Change Attributable to State Factors
			LCI _{final} - LCI _{initial}	% of LCI _{initial}		
I 1984-86 to 1986-88	0.7129	0.7113	-0.0016	-0.224 ¹	49.560	53.440
II 1986-88 to 1988-90	0.7113	0.7345	0.0232	3.262 ²	44.903	55.097
III 1988-90 to 1990-92	0.7345	0.7846	0.0501	6.821 ²	45.228	54.772
IV 1990-92 to 1992-94	0.7846	0.8633	0.0787	10.031 ²	35.870	64.130
V 1992-94 to 1994-96	0.8633	0.8446	-0.0187	-2.166 ³	59.341	40.659
VI 1994-96 to 1996-98	0.8446	0.8021	-0.0425	-5.032 ³	72.581	27.419

¹ Balanced Change - LCI Biennial Change Rate is approximately equally attributable to local and state factors.

² Divergent Change - Low fiscal capacity localities experienced decreases in their LCI values and high fiscal capacity localities experienced increases in their LCI values.

³ Convergent Change - Low fiscal capacity localities experienced increases in their LCI values and high fiscal capacity experienced decreases in their LCI values.

The rationalized structure of the Local Composite Index reflects the consequences of being able to influence the rate of change in the State or denominator portion of the ratio structure. The structure appears to favorably inhibit large increases in the Fairfax County Local to State Ratios during Periods of Balanced Growth. Further, during Periods of Convergent Growth the ratio structure appears to support decreases in the Local to State Ratio, when the Local Standardized Indicator declines.

For the Local Composite Index rationalized structure relative to Fairfax County there are three concerns:

- the synthetic change rate effects that occur, when the Local ADM or POP Biennial Change (Growth) Rate is larger than the Local Indicator Biennial Change (Growth) Rate,
- the large influence that Fairfax County Local Indicator and Local Standardized Indicator values have on the corresponding (mean) State values in the calculation of Biennial Change Rates, because this school system is the largest in the Commonwealth,
- the subordination of local changes in the fiscal capacity indicators to the rationalized structure of the LCI formula.