

III. Loudoun County

Loudoun County is a suburban county in northern Virginia in close proximity to Washington, D.C. It is a moderately high fiscal capacity ($LCI_{1996-98} = 0.0.7322$) school division. Loudoun County is typical of many suburban jurisdictions in the Commonwealth exhibiting fast change to its relatively large indicator bases. The Loudoun County average daily membership and its population have frequently grown faster than the state average.

Local to State Ratio Net Biennial Change Rate.

$(TPV/ADM)_{Loudoun} / (TPV/ADM)_{State}$ (Table 4.31)

For Loudoun County the steadily increasing ADM always contributed to the dampening *within* the Local Net Biennial Change Rate. For every Period the State Net Biennial Change Rate dampened, either incompletely (Periods II, III, and IV) or completely (Periods I and V), the magnitude of the corresponding Local Net Biennial Change Rate. Similar to the low fiscal capacity localities the degree of dampening in Period I was miniscule (-0.0184%). Periods II-IV exhibited Local Net Biennial Change Rates ranging from approximately 21.200% to 76.844% in the TPV/ADM base. However, these local percentage increases were much larger than the corresponding State Net Biennial Change Rates, thus producing positive differences in their Local to State Ratios. For Period V the Local Net Biennial Change Rate was negative (-3.759%) due to synthetic change in the Local Net Biennial Change Rate.¹¹² The State Net Biennial Change Rate (5.363%) completely dampened further the local synthetic decrease.

In Period VI the Local Net Biennial Change Rate was synthetically decreased due to the negative Biennial Change Rates in both TPV (-18.930%) and ADM (-9.550%). Thus, the Local Net Biennial Change Rate that was lower (-28.480%) than that of the State (-1.311%). The direction of the dampening effect for this Period was the opposite of the dampening effect for previous Periods. This dampening effect tended to dampen the "loss" in the Local Standardized Indicator, thus dampening it to a larger value toward zero. For most localities in the Commonwealth this negative State Net Biennial Change Rate was smaller (more negative) than the local value, which enhanced rather than dampened the magnitude of their Local Net Biennial Change Rate. Although these

¹¹² For Loudoun County the Period V TPV/ADM: ADM gain was -5.418% which was greater than the TPV_{Loudoun} indicator gain of 1.659%. This situation caused the $(TPV/ADM)_{Loudoun}$ to exhibit a Net Biennial Change Rate of -8.290%. Refer to the appropriate sections in Volume II: Technical Appendix for further explanation.

phenomena served to increase or dampen in a positive direction the Local to State Ratio, the Net Biennial Change Rate of the Local to State Ratio was decreased over its initial value.

(TPV/POP)_{Loudoun} / (TPV/POP)_{State} (Table 4.32)

Similar to the $TPV/ADM_{Loudoun}$ the POP component exhibited a dampened volatility pattern. The State Net Biennial Change Rate dampened, either completely (Period I) or incompletely (Periods II - IV), the magnitude of the Local Net Biennial Change. The degree of dampening in Period I was the smallest (-0.0379%). Periods II-IV exhibited the typical volatility pattern of incomplete dampening for localities whose Net Biennial Change Rates exceeded the State rates. However, in Period V the State Net Biennial Change Rate dropped to 5.325% (partly due to the sharp increase in ADM_{State}), thus, the dampening became complete. The Local to State Ratio decreased (-0.1229). In Period VI the Local Net Biennial Change Rate was more negative (-10.871) than the State (-2.169). Therefore, although the Local to State Ratio decreased for this biennium, it did not express the full extent attributable solely to the Local Net Biennial Change Rate.

TABLE 4.31. (TPV/ADM)_{Loudoun} 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	13.758	-	15.064	=	-1.306	-0.0184	Type B3
II 86-88 to 88-90	21.200	-	16.538	=	4.662	0.0649	Type A2
III 88-90 to 90-92	76.844	-	39.082	=	37.762	0.5503	Type A2
IV 90-92 to 92-94	75.341	-	42.774	=	32.568	0.6539	Type A2
V 92-94 to 94-96	-3.759	-	5.363	=	-9.122	-0.2428	Type F1
VI 94-96 to 96-98	-28.480	-	-1.311	=	-27.169	-0.6572	Type G2

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

TABLE 4.32. (TPV/POP)_{Loudoun} 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	7.317	-	9.745	=	-2.428	-0.0421	Type B2
II 86-88 to 88-90	17.144	-	13.555	=	3.589	0.0608	Type A2
III 88-90 to 90-92	65.728	-	33.386	=	32.343	0.5674	Type A2
IV 90-92 to 92-94	60.713	-	35.849	=	24.865	0.5773	Type A2
V 92-94 to 94-96	-8.292	-	5.325	=	-13.617	-0.3947	Type F1
VI 94-96 to 96-98	-26.662	-	-1.784	=	-24.877	-0.6230	Type G1

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

(AGI/ADM)_{Loudoun} / (AGI/ADM)_{State} (Table 4.33)

The AGI/ADM Local to State Ratio exhibited increases in its Net Biennial Change Rate. For all Periods the State Net Biennial Change Rate incompletely dampened the magnitude of the Local Net Biennial Change Rate. Loudoun County always exhibited Local Net Biennial Change Rates that were higher than the State, although its Local Net Biennial Change Rates declined from a high of 42.673% (Period II) to 8.637% (Period V).

(AGI/POP)_{Loudoun} / (AGI/POP)_{State} (Table 4.34)

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 (I, II, III, and VI) in addition to incomplete dampening (IV and V) of the Local Net Biennial Change Rate. This incomplete dampening occurred due to large declines to smaller Local and State Biennial Change Rates, where Loudoun exhibited rates just slightly smaller than the State.

TABLE 4.33. (AGI/ADM)_{Loudoun} 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	22.094	-	20.036	=	2.0580	0.0204	Type A3
II 86-88 to 88-90	42.673	-	22.872	=	19.800	0.2001	Type A2
III 88-90 to 90-92	35.028	-	22.918	=	12.110	0.1466	Type A2
IV 90-92 to 92-94	12.402		9.969	=	2.433	0.0330	Type A2
V 92-94 to 94-96	8.637	-	4.596	=	4.040	0.0562	Type A2
VI 94-96 to 96-98	10.245	-	8.615	=	1.631	0.0236	Type A2

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

TABLE 4.34. (AGI/POP)_{Loudoun} 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	15.180	-	14.283	=	0.897	0.0109	Type A2
II 86-88 to 88-90	37.898	-	19.325	=	18.573	0.2283	Type A2
III 88-90 to 90-92	26.540	-	18.841	=	7.700	0.1122	Type A2
IV 90-92 to 92-94	3.025	-	6.544	=	-3.519	-0.0552	Type B2
V 92-94 to 94-96	3.520	-	4.626	=	-1.106	-0.0168	Type B2
VI 94-96 to 96-98	13.048	-	8.219	=	4.829	0.0723	Type A2

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

(TRS/ADM)_{Loudoun} / (TRS/ADM)_{State} (Table 4.35)

For five Periods (I, II, II, IV, and VI) the State Net Biennial Change Rate dampened incompletely the Local to State Ratio. In each the Local Net Biennial Change Rate was greater than the State Net Biennial Change Rate.

An exception occurred in the fifth Period, which exhibited complete dampening and a decrease in its Local to State Ratio. The negative value (-7.027%) in the Local Net Biennial Change Rate was due to an unusual situation in which the $TRS_{Loudoun}$ indicator dropped to a negative (-1.793%) Biennial Change Rate¹¹³, while the $ADM_{Loudoun}$ exhibited a gain (5.334%) in its Biennial Change Rate. This phenomenon produced a smaller, negative Local Standardized Indicator for $(TRS/ADM)_{Loudoun}$. Meanwhile, the State Standardized Indicator experienced a similar situation in which the ADM_{State} grew at a faster rate than the TRS_{State} . Ultimately, 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%), which contributed to a decrease (synthetic, in the TRS indicator did not become negative) in the Local to State Net Biennial Change Rate. Thus, in this case the synthetic change in the State Standardized Indicator dampened the Local Net Biennial Change Rate completely.

(TRS/POP)_{Loudoun} / (TRS/POP)_{State} (Table 4.36)

Its volatility pattern was similar to that for TRS/ADM as discussed above.

¹¹³ Refer to the appropriate sections in Volume II: Technical Appendix for these indicator and ADM biennial change rates. It is important to note that although Loudoun County decreased to a negative value in TRS, the State did not. However, with regard to the State Standardized Indicator the value was negative to a lower TRS value evaluated with a higher ADM value.

TABLE 4.35. (TRS/ADM)_{Loudoun} 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	32.416	-	22.526	=	9.890	0.0917	Type B4
II 86-88 to 88-90	34.891	-	28.958	=	5.933	0.0604	Type A2
III 88-90 to 90-92	35.626	-	19.312	=	16.314	0.1760	Type A2
IV 90-92 to 92-94	17.275	-	10.117	=	7.158	0.0898	Type A2
V 92-94 to 94-96	-7.027	-	-1.392	=	-5.635	-0.0758	Type G1
VI 94-96 to 96-98	6.362	-	10.145	=	-3.783	-0.0480	Type B2

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

TABLE 4.36. (TRS/POP)_{Loudoun} 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	24.918	-	16.277	=	8.640	0.0985	Type A2
II 86-88 to 88-90	30.377	-	25.530	=	4.848	0.0600	Type A2
III 88-90 to 90-92	27.101	-	15.363	=	11.738	0.1525	Type A2
IV 90-92 to 92-94	7.491	-	6.560	=	0.931	0.0135	Type A2
V 92-94 to 94-96	-11.406	-	-1.103	=	-10.303	-0.1509	Type G1
VI 94-96 to 96-98	9.006	-	9.822	=	-0.756	-0.0099	Type B2

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

Local Composite Index Net Biennial Change Rate. (Table 4.37)

The LCI for Loudoun County increased from 0.6774 (Period I) to 1.0752 (Period IV), then decreased to 0.8480 between Periods V and VI. The Loudoun County Local Composite Index¹¹⁴ value exhibited three patterns of change. The relationship of these types of LCI change will be related to the volatility patterns observed for Loudoun County.

For the first Period (I) the approximately equal percentages (50.416% Local and 49.584% State) of Local and State factors indicated that the change in the LCI was attributable almost equally to both entities, a characteristic of Balanced Change. Except for TPV, each Local to State Ratio exhibited positive Net Biennial Change, which increased the LCI from 0.6774 to 0.6790.

Divergent Change appeared to occur in Periods II, III, and IV during which the LCI increased from 8.954% to 23.574%. The Local percentages of LCI Change ranged from 33.758 to 44.912%, while the State percentages of Net LCI Biennial Change ranged from 60.168% to 55.088% as shown in Table 4.36. During these three Periods each Local to State Ratio exhibited the A2 volatility type. Thus, although each Local to State Ratio underwent dampening, because it was incomplete in nature, the composite effect on the LCI was one of increase; from 0.3962 points over the three Periods to an LCI of 1.0752 - a tremendous increase.

In the final two Periods (V and VI) the LCI decreased 6.696% and 15.421%, respectively. These declines were consistent with a Convergent Change volatility pattern whereby high fiscal capacity localities experienced decreases in their LCI values. For the fifth Period (V) the TRS/ADM and TRS/POP Local to State Ratios exhibited enhanced (synthetic) change, while the other Local to State Ratios experienced dampened change. This small enhancement (approximately 1.5 percent), when taken with the degree of dampening present at that time in the other four Local to State Ratios, appeared to contribute to a lessening of the decrease in the LCI to 1.0032. The Local percentages of LCI Change increased from 57.042% to 87.436%, indicating a dampening of the negative local change.

Similarly, in the sixth Period (VI) the TPV/ADM and TPV/POP Local to State Ratios exhibited strong negative change (-27.169% and -24.877%, respectively). However, this negative change (decline) was dampened by the decline in the State Net Biennial Change Rate. The other Local to State Ratios exhibited completely and incompletely dampened change. Thus, the LCI dropped to 0.8480, which is not as far as it could have declined, if only the Local effects were considered.

¹¹⁴ 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.

During Period VI Loudoun County exhibited a distinctive decline in its TPV Indicator, which affected the Local Net Biennial Change Rates to decline precipitously; -28.480% (TPV/ADM) and -26.662% (TPV/POP), at a time when the State showed a very small decline in these Standardized Indicators. Thus, these respective Local to State Ratios also exhibited large negative Net Biennial Change Rates for Loudoun County. The LCI declined from 1.0032 to 0.8480. The Percentage of Change in the LCI attributable to Local Factors was 87.436% and to State Factors was 12.564%.

For the Loudoun County there are three concerns regarding the rationalized structure of the LCI formula:

- 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 extremely potent influence that a large school division, such as Loudoun can have on the corresponding (mean) State values in the calculation of the Biennial Change Rates. This is particularly acute, when a large school division exhibits a change in one or more Indicators of a very large magnitude, as did Loudoun with respect to its TPV in Period VI.
- the subordination of local changes in fiscal capacity indicators to the rationalized structure of the LCI formula.

TABLE 4.37. Local Composite Index Values, Net Biennial Change Rate, and Local and State Percentages, Loudoun 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	0.6774	0.6790	+0.0016	+0.236 ¹	50.416	49.584
II 1986-88 to 1988-90	0.6790	0.7398	+0.0608	+8.954 ²	33.758	66.242
III 1988-90 to 1990-92	0.7398	0.9142	+0.1744	+23.573 ²	44.912	55.088
IV 1990-92 to 1992-94	0.9142	1.0752	+0.1610	+17.611 ²	39.832	60.168
V 1992-94 to 1994-96	1.0752	1.0032	-0.0720	-6.709 ³	57.042	42.958
VI 1994-96 to 1996-98	1.0032	0.8480	-0.1552	-15.470 ³	87.436	12.564

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.