Web appendix 4: Further model specifications

Slope change following a lag (figure 2 (d)):

Here, the start of the intervention can be coded as 1 following the lag (rather than immediately after the intervention). For example, in Table 4.1, if we assume a 6 month lag and the intervention was introduced in January 2005, we code the intervention as 1 from July 2005. We then use the usual slope change regression model: $Y_t = \beta_0 + \beta_1 T + \beta_3 (T - T_0) \cdot X_t$ with β_3 representing the slope change.

Table 4.1: variable specification for slope change following a lag

Year	Month	Time elapsed (T)	Smoking ban lagged (X)	ACEs (Y)	Std popn
2004	1	25	0	914	381656.3
2004	2	26	0	808	383680
2004	3	27	0	937	383504.2
2004	4	28	0	840	386462.9
2004	5	29	0	916	383783.1
2004	6	30	0	828	380836.8
2004	7	31	0	845	383483
2004	8	32	0	818	380906.2
2004	9	33	0	860	382926.8
2004	10	34	0	839	384052.4
2004	11	35	0	887	384449.6
2004	12	36	0	886	383428.4
2005	1	37	0	831	388153.2
2005	2	38	0	796	388373.2
2005	3	39	0	833	386470.1
2005	4	40	0	820	386033.2
2005	5	41	0	877	383686.4
2005	6	42	0	758	385509.3
2005	7	43	1	767	385901.9
2005	8	44	1	738	386516.6
2005	9	45	1	781	388436.5
2005	10	46	1	843	383255.2
2005	11	47	1	850	390148.7
2005	12	48	1	908	385874.9

Temporary level change (figure 2 (e)):

This model may be used where a reversible intervention is introduced temporarily. For example, if the intervention were introduced for six months, then withdrawn, the variables may be specified as per Table 4.2. A level change regression model could then be run as follows: $Y_t = \beta_0 + \beta_1 T + \beta_2 X_t + \beta_3 W_t$ where β_2 represents the level change at introduction and β_3 represents the remaining level change at withdrawal. Under the assumption that the latter is null, and that the level comes back to the underlying trend, $\beta_3 W_t$ can be excluded.

Table 4.2: variable specification for a temporary level change

Year	Month	Time elapsed (T)	Smoking ban introduced (X)	Smoking ban withdrawn (W)	ACEs (Y)	Std popn
2004	1	25	0	0	914	381656.3
2004	2	26	0	0	808	383680
2004	3	27	0	0	937	383504.2
2004	4	28	0	0	840	386462.9
2004	5	29	0	0	916	383783.1
2004	6	30	0	0	828	380836.8
2004	7	31	0	0	845	383483
2004	8	32	0	0	818	380906.2
2004	9	33	0	0	860	382926.8
2004	10	34	0	0	839	384052.4
2004	11	35	0	0	887	384449.6
2004	12	36	0	0	886	383428.4
2005	1	37	1	0	831	388153.2
2005	2	38	1	0	796	388373.2
2005	3	39	1	0	833	386470.1
2005	4	40	1	0	820	386033.2
2005	5	41	1	0	877	383686.4
2005	6	42	1	0	758	385509.3
2005	7	43	0	1	767	385901.9
2005	8	44	0	1	738	386516.6
2005	9	45	0	1	781	388436.5
2005	10	46	0	1	843	383255.2
2005	11	47	0	1	850	390148.7
2005	12	48	0	1	908	385874.9

Temporary slope change leading to a level change (Figure 2(f)):

This model could be used to represent a phase during which an intervention was gradually introduced in which case we may be interested in the slope change as the intervention was phased in, as well as the absolute level change following its introduction. The variable specification in Table 4.3 can be used with the following regression model: $Y_t = \beta_0 + \beta_1 T + \beta_2 X_t$. The parameterization of X_t in Table 4.3 allows a

gradual change change over 5 months, and β_2 represents the full change at the end of the implementation period.

Table 4.3: variable specification for a temporary level change or temporary slope change

Year	Month	Time elapsed (T)	Intervention phased in (X)	ACEs (Y)	Std popn
2004	1	25	0	914	381656.3
2004	2	26	0	808	383680
2004	3	27	0	937	383504.2
2004	4	28	0	840	386462.9
2004	5	29	0	916	383783.1
2004	6	30	0	828	380836.8
2004	7	31	0	845	383483
2004	8	32	0	818	380906.2
2004	9	33	0	860	382926.8
2004	10	34	0	839	384052.4
2004	11	35	0	887	384449.6
2004	12	36	0	886	383428.4
2005	1	37	0.2	831	388153.2
2005	2	38	0.4	796	388373.2
2005	3	39	0.6	833	386470.1
2005	4	40	0.8	820	386033.2
2005	5	41	1	877	383686.4
2005	6	42	1	758	385509.3
2005	7	43	1	767	385901.9
2005	8	44	1	738	386516.6
2005	9	45	1	781	388436.5
2005	10	46	1	843	383255.2
2005	11	47	1	850	390148.7
2005	12	48	1	908	385874.9