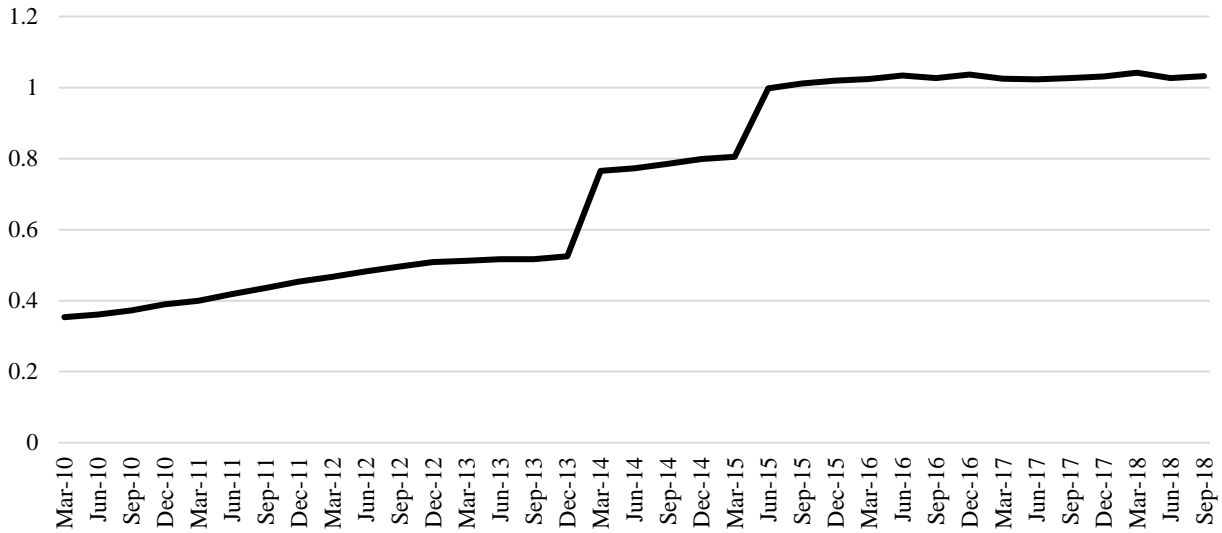


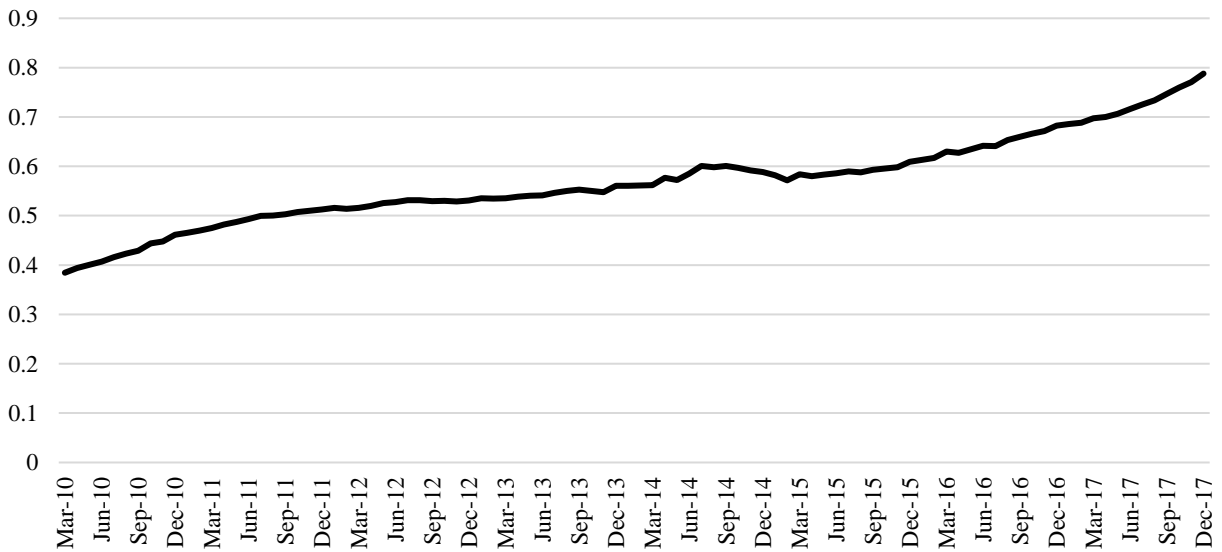
## Appendix A

**Figure A1** Number of credit card per capita in Chile (adult population Mars 2010 -December 2017)



**Source:** SBIF 2018

**Figure A2** Number of individual contracts with mobile phone companies per capita in Chile (adult population) Mars 2010 -December 2017



**Source:** Subsecretaría de Telecomunicaciones 2018

## Appendix B

List with municipalities per urban conglomerate

<b>Urban conglomerate</b>	<b>Municipalities</b>
Santiago	Santiago, Cerrillos, Cerro Navia, Conchalí, El Bosque, Estación Central, Huechuraba, Independencia, La Cisterna, La Florida, La Granja, La Pintana, La Reina, Las Condes, Lo Barnechea, Lo Espejo, Lo Prado, Macul, Maipú, Ñuñoa, Pedro Aguirre Cerda, Peñalolén, Providencia, Pudahuel, Quilicura, Quinta Normal, Recoleta, Renca, San Joaquín, San Miguel, San Ramón, Vitacura, Puente Alto, Lampa, and San Bernardo
Concepción	Concepción, Coronel, Chiguayante, San Pedro De La Paz, Lota, Hualpén, Talcahuano and Los Ángeles.
Valparaíso-Viña del Mar	Valparaíso, Concón, Viña Del Mar, Quilpué, Villa Alemana, San Antonio and Quillota.

## Appendix C

Tables C1-C3 Models with number of crashes as denominator and Table C4 with number of crashes as outcomes

Table C1 Associations of three interventions on alcohol-related motor vehicle crashes per 1 000 crashes, Santiago, January 1<sup>st</sup> 2010 – December 31<sup>st</sup> 2017

	Naïve model			Uber-oriented model			Full model		
	$\beta$	95%	CI	$\beta$	95%	CI	$\beta$	95%	CI
Time	0.056	0.004	0.108	0.034	-0.101	0.168	0.056	-0.030	0.142
Zero tolerance law	-10.880	-19.380	-2.380	-13.572	-24.777	-2.367	-11.761	-22.521	-1.000
Zero tolerance law change in trend				0.113	-0.102	0.328	0.004	-0.175	0.184
Emilia law	-4.587	-13.734	4.560	-5.482	-15.719	4.756	-14.730	-25.432	-4.027
Emilia law change in trend				-0.111	-0.272	0.051	-0.730	-1.181	-0.279
Uber	0.105	-8.426	8.636	-4.740	-15.634	6.155	-11.580	-23.070	-0.091
Uber change in trend							0.701	0.225	1.177
Constant	34.043	28.446	39.641	35.004	26.306	43.703	34.680	27.459	41.901
AR1		0.928						0.913	
MA1		0.847						0.850	
AIC		3282.347			3284.42			3278.61	
Ljung-Box test		25.24			25.70			26.38	
K=24, Prob > chi2(23)		0.286			0.265			0.236	
Ljung-Box test		49.53			49.79			50.82	
K=48, Prob > chi2(47)		0.334			0.325			0.289	

Table C2 Associations of three interventions on alcohol-related motor vehicle crashes per 1 000 crashes, Concepción, January 1<sup>st</sup> 2010 – December 31<sup>st</sup> 2017

	Naïve model			Uber-oriented model			Full model		
	$\beta$	95%	CI	$\beta$	95%	CI	$\beta$	95%	CI
Time	0.009	-0.102	0.119	-0.091	-0.289	0.107	-0.091	-0.288	0.106
Zero tolerance law	-14.900	-31.447	1.646	-8.082	-26.210	10.046	-8.051	-26.078	9.975
Zero tolerance law change in trend				0.082	-0.176	0.334	0.081	-0.175	0.338
Emilia law	-0.924	-16.735	14.886	-6.710	-24.312	10.892	-11.937	-31.341	7.467
Emilia law change in trend				0.171	-0.105	0.446	0.288	-0.043	0.620
Uber	11.335	-3.272	25.942	-0.002	-0.045	0.040	-0.258	-21.974	21.458
Uber change in trend							-0.282	-0.732	0.167
Constant	68.195	58.809	77.582	74.016	60.642	87.389	74.013	60.717	87.310
AR1		-0.059			-0.065			-0.068	
AR3		0.102			0.093			0.091	
AIC		4174.628			4175.741			4176.190	
Ljung-Box test		17.11			18.88			19.92	
K=24, Prob > chi2(22)		0.757			0.653			0.588	
Ljung-Box test		37.25			39.87			41.31	
K=48, Prob > chi2(46)		0.818			0.723			0.669	

AR: Autoregressive; MA: Moving Average; AIC: Akaike information criterion

Table C3 Associations of three interventions on alcohol-related motor vehicle crashes per 1 000 crashes, Valparaíso-Viña del Mar, January 1<sup>st</sup> 2010 – December 31<sup>st</sup> 2017

	Naïve model			Uber-oriented model			Full model		
	$\beta$	95%	CI	$\beta$	95%	CI	$\beta$	95%	CI
Time	-0.065	-0.139	0.009	-0.005	-0.134	0.125	-0.005	-0.136	0.126
Zero tolerance law	-9.476	-20.556	1.604	-7.646	-19.601	4.308	-7.648	-19.610	4.314
Zero tolerance law change in trend				-0.140	-0.309	0.030	-0.140	-0.309	0.030
Emilia law	2.814	-7.616	13.245	5.156	-6.157	16.469	5.906	-7.499	19.311
Emilia law change in trend				0.153	-0.028	0.334	0.134	-0.122	0.390
Uber	11.783	2.012	21.554	5.538	-8.778	19.853	5.699	-8.711	20.110
Uber change in trend							0.031	-0.268	0.330
Constant	51.949	45.684	58.215	48.482	39.686	57.278	48.482	39.681	57.284
AR1		0.317			0.210			0.207	
MA1		0.219			0.124			0.121	
AIC		3765.456			3765.614			3767.571	
Ljung-Box test		26.97			27.73			27.69	
K=24, Prob > chi2(22)		0.213			0.185			0.186	
Ljung-Box test		51.76			52.36			52.28	
K=48, Prob > chi2(46)		0.259			0.241			0.243	

AR: Autoregressive; MA: Moving Average; AIC: Akaike information criterion

Table C4. Associations of three interventions on all vehicle crashes per 1 000 000 population, Santiago, Concepción and Valparaíso-Viña del Mar, January 1st 2010 – December 31st 2017

	Santiago				Concepción				Valparaíso			
	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>
Time	0.020	0.003	0.037	0.021	0.009	-0.022	0.039	0.762	0.012	-0.017	0.041	0.427
Zero tolerance law	-0.788	-2.090	0.514	0.235	2.068	-0.827	4.963	0.174	-1.101	-3.141	0.939	0.290
Zero tolerance law change in trend	-0.008	-0.037	0.020	0.572	0.015	-0.021	0.052	0.342	-0.011	-0.053	0.030	0.590
Emilia law	-1.452	-3.032	0.127	0.071	-1.204	-4.415	2.008	0.275	-0.055	-2.212	2.101	0.960
Emilia law change in trend	0.021	-0.045	0.087	0.530	0.014	-0.037	0.064	0.275	0.054	0.003	0.106	0.004
Uber	-0.112	-1.717	1.494	0.892	-1.107	-4.893	2.679	0.308	-0.157	-2.384	2.069	0.890
Uber trend	-0.003	-0.072	0.066	0.923	0.000	-0.074	0.075	0.801	-0.083	-0.141	-0.026	0.005
Constant	10.283	8.8054	11.761	<0.001	16.429	14.434	18.424	<0.001	16.175	13.338	19.012	<0.001

**Appendix D**  
Models with Stata

**Table D1** Associations of three interventions on alcohol-related motor vehicle crashes per 1 000 0000 population, Santiago, January 1<sup>st</sup> 2010 – December 31<sup>st</sup> 2017

	Naïve model				Uber-oriented model				Full model			
	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>
Time	0.004	0.002	0.007	<0.001	0.002	-0.002	0.006	0.347	0.002	-0.002	0.006	0.334
Zero tolerance law	-0.682	-0.970	-0.393	<0.001	-0.589	-1.005	-0.174	0.002	-0.521	-0.902	-0.140	0.007
Zero tolerance law trend					0.003	-0.004	0.009	0.357	0.001	-0.005	0.008	0.685
Emilia law	-0.162	-0.534	0.210	0.396	-0.225	-0.611	0.161	0.253	-0.661	-1.195	-0.127	0.015
Emilia law trend					-0.001	-0.006	0.005	0.905	-0.024	-0.044	-0.004	0.019
Uber	-0.016	-0.367	0.334	0.926	-0.074	-0.545	0.395	0.755	-0.455	-0.980	0.069	0.089
Uber trend									0.025	0.004	0.050	0.016
_cons	1.529	1.354	1.705	<0.001	1.658	1.393	1.924	<0.001	1.657	1.366	1.948	<0.001
AR1	0.939	0.710	1.168	0.003	0.134	0.042	0.225	0.004	0.123	0.031	0.215	0.008
AR2	-0.068	-0.171	0.035	0.393	-0.068	-0.169	0.034	0.406	-0.064	-0.163	0.036	0.498
AIC		837.801				840.648				837.654		
Ljung-Box test		26.171				26.573				26.851		
Prob > chi2(21)		0.180				0.185				0.175		
Ljung-Box test		50.54				50.578				50.96		
Prob > chi2(40)		0.122				0.122				0.114		

AR: AutoRegressive; AIC: Akaike information criterion; BIC Bayesian information criterion

**Table D2** Associations of three interventions on alcohol-related motor vehicle crashes per 1 000 0000 population, Concepción, January 1<sup>st</sup> 2010 – December 31<sup>st</sup> 2017

	Naïve model				Uber-oriented model				Full model			
	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>
Time	0.004	-0.004	0.012	0.341	-0.012	-0.002	0.005	0.163	-0.012	-0.029	0.005	0.158
Zero tolerance law	-1.080	-2.273	0.113	0.076	-0.079	-1.355	1.197	0.903	-0.082	-1.341	1.177	0.899
Zero tolerance law trend					0.015	-0.004	0.035	0.119	0.015	-0.003	0.034	0.114
Emilia law	-0.101	-1.178	0.974	0.853	-1.067	-2.117	-0.016	0.046	-1.626	-2.772	-0.480	0.005
Emilia law trend					0.023	0.004	0.041	0.014	0.035	0.013	0.057	0.002
Uber	0.582	-0.464	0.334	1.630	-1.338	-2.904	0.227	0.094	-1.175	-2.691	0.339	0.128
Uber trend									-0.029	-0.061	0.002	0.068
_cons	4.654	3.851	5.457	<0.001	5.611	4.352	6.870	<0.001	5.608	4.366	6.850	<0.001
AR1	-0.077	-0.175	0.020	0.122	-0.102	-0.199	-0.005	0.039	-0.110	-0.207	-0.013	0.025
AR2	-0.089	-0.191	0.012	0.087	-0.115	-0.217	-0.012	<0.001	-0.123	-0.225	-0.021	0.017
AIC		2150.216				2141.386				2139.864		
Ljung-Box test		19.929				18.040				20.913		
Prob > chi2(21)		0.525				0.646				0.464		
Ljung-Box test		25.973				25.385				29.492		
Prob > chi2(40)		0.957				0.965				0.888		

AR: AutoRegressive; AIC: Akaike information criterion; BIC Bayesian information criterion



**Table D3** Associations of three interventions on alcohol-related motor vehicle crashes per 1 000 0000 population, Valparaíso-Viña del Mar, January 1<sup>st</sup> 2010 – December 31<sup>st</sup> 2017

	Naïve model				Uber-oriented model				Full model			
	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>
Time	-0.006	-0.012	-0.000	0.034	0.002	-0.008	0.014	0.592	0.002	-0.008	0.013	0.592
Zero tolerance law	-0.322	-1.326	0.681	0.529	-0.384	-1.503	0.733	0.500	-0.384	-1.501	0.731	0.500
Zero tolerance law trend					-0.016	-0.030	-0.009	-0.016	-0.016	-0.030	-0.003	-0.019
Emilia law	0.498	-0.260	1.257	0.198	0.903	0.108	1.698	0.026	0.651	-0.348	1.651	0.202
Emilia law trend					0.008	-0.005	0.022	0.214	0.014	-0.004	0.034	0.137
Uber	0.972	0.171	1.774	0.017	0.084	-0.321	2.001	0.156	0.782	-0.374	1.940	0.185
Uber trend									-0.010	-0.032	0.058	0.364
_cons	3.728	3.192	4.264	<0.001	3.184	2.470	3.897	<0.001	5.621	4.323	6.920	<0.001
AR1	0.058	-0.066	0.184	0.359	0.045	-0.077	0.169	0.469	0.240	-0.030	0.510	0.025
AIC		1766.088				1765.133				1766.486		
Ljung-Box test		23.160				24.348				24.668		
Prob > chi2(21)		0.335				0.276				0.321		
Ljung-Box test		41.087				42.664				43.279		
Prob > chi2(40)		0.422				0.357				0.333		

AR: AutoRegressive; AIC: Akaike information criterion; BIC Bayesian information criterion.

## Appendix E

Equations used in each model

The Naïve model:  $Y_w = \beta_0 + \beta_1 T_w + \beta_2 I1 + \beta_3 I2 + \beta_4 Uber + \epsilon_w$  (1)

$Y_w$ =Weekly crash rates;

$T$  = Time

$I1$ =Zero tolerance law;

$I2$ = Emilia law;

$Uber$ =Date in which Uber was launched

$\epsilon$  = Error term

The Uber oriented model:  $Y_w = \beta_0 + \beta_1 T_w + \beta_2 I1 + \beta_3 Post\_I1_w + \beta_4 I2 + \beta_5 Post\_I2_w + \beta_6 Uber + \epsilon_w$  (2)

$Y_w$ =Weekly crash rates;

$T$  = Time

$I1$ =Zero tolerance law;

$Post\_I1$  = Zero tolerance law post-intervention period

$I2$ = Emilia law;

$Post\_I2$  = Emilia law post-intervention period

**Uber**=Date in which Uber was launched

$\epsilon$  = Error term

The Full model:  $Y_w = \beta_0 + \beta_1 T_w + \beta_2 I1 + \beta_3 Post\_I1_w + \beta_4 I2 + \beta_5 Post\_I2_w + \beta_6 Uber + \beta_7 Post\_Uber_w + \epsilon_w$  (3)

$Y_w$  = Weekly crash rates;

$T$  = Time

$I1$  = Zero tolerance law;

**Post\_I1** = Zero tolerance law post-intervention period

$I2$  = Emilia law;

**Post\_I2** = Emilia law post-intervention period

**Uber** = Date in which Uber was launched

**Post\_Uber** = Uber post-intervention period

$\epsilon$  = Error term

## Appendix F

**Table F1** Associations of three interventions on alcohol-related motor vehicle crashes rates per 1 000 0000 population, Santiago, January 1· 2010 – December 31· 2017

	Naïve model				Uber-oriented model				Full model			
	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>
Time	0.003	0.001	0.004	<0.001	0.001	-0.002	0.005	0.461	0.001	-0.002	0.005	0.419
Zero tolerance law	-0.451	-0.690	-0.229	<0.001	-0.407	-0.736	-0.077	0.016	-0.342	-0.666	-0.017	0.039
Zero tolerance law change in trend					0.002	-0.003	0.008	0.434	0.000	-0.005	0.006	0.846
Emilia law	-0.098	-0.369	0.173	0.476	-0.140	-0.425	0.144	0.333	-0.462	-0.854	-0.070	0.021
Emilia law change in trend					-0.000	-0.005	0.004	0.844	-0.019	-0.035	-0.002	0.028
Uber	-0.028	-0.285	0.229	0.831	-0.080	-0.444	0.285	0.668	-0.348	-0.775	0.079	0.110
Uber trend									0.020	0.002	0.037	0.025
Constant	1.09	0.941	1.239	<0.001	1.175	0.943	1.407	0.009	1.172	0.950	1.395	<0.001
AR1	0.983	0.035	0.230	0.008	0.131	0.034	0.229	0.121	0.119	0.021	0.217	0.017
AR2	0.077	-0.019	0.174	0.117	0.076	-0.020	0.173	0.007	0.066	-0.031	0.163	0.180
AR8	0.133	0.036	0.230	0.007	0.134	0.036	0.231		0.128	0.030	0.226	0.010
AIC		533.294				536.351				533.299		
Ljung-Box test		0.000				0.000				0.000		
Prob > chi2(1)		0.979				0.981				0.987		
Ljung-Box test		21.41				21.28				22.03		
K=24, Prob > chi2(20)		0.373				0.21				0.339		
Ljung-Box test		47.24				47.23				47.14		
K=48, Prob > chi2(44)		0.342				0.342				0.3454		

AR: Autoregressive; AIC: Akaike information criterion;

**Table F2** Associations of three interventions on alcohol-related motor vehicle crashes rates per 1 000 000 population, Concepción, January 1 2010 – December 31<sup>s</sup> 2017

	Naïve model				Uber-oriented model				Full model			
	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>	$\beta$	95%	CI	<i>P-value</i>
Time	0.003	-0.002	0.008	0.269	-0.006	-0.014	0.003	0.195	-0.006	-0.014	0.003	0.189
Zero tolerance law	-0.676	-1.424	0.072	0.077	-0.116	-0.913	0.682	0.776	-0.117	-0.902	0.668	0.770
Zero tolerance law change in trend					0.008	-0.004	0.019	0.185	0.008	-0.003	0.019	0.178
Emilia law	-0.195	-0.908	0.518	0.591	-0.707	-1.483	0.068	0.074	-1.045	-1.892	-0.198	0.016
Emilia law change in trend					0.014	0.002	0.026	0.026	0.021	0.007	0.202	0.004
Uber	0.463	-0.195	1.121	0.168	-0.627	-1.589	0.335	0.201	-0.529	-1.482	0.425	0.276
Uber trend									-0.018	-0.037	0.002	0.070
Constant	3.051	2.630	3.472	<0.001	3.551	2.966	4.135	<0.001	3.549	2.974	4.124	<0.001
AR1	-0.077	-0.174	0.020	0.121	-0.096	-0.193	0.001	0.052	-0.104	-0.202	-0.007	0.036
AR2	-0.106	-0.203	-0.008	0.033	-0.126	-0.224	-0.029	0.011	-0.135	-0.232	-0.037	0.007
AIC		1751.893				1745.719				1744.389		
Ljung-Box test		18.02				16.64				18.90		
K=24, Prob > chi2(22)		0.705				0.783				0.686		
Ljung-Box test		31.01				31.23				34.89		
K=48, Prob > chi2(46)		0.956				0.953				0.884		

AR: Autoregressive; AIC: Akaike information criterion

1 **Table F3** Associations of three interventions on alcohol-related motor vehicle crashes rates per 1 000 000 population, Valparaíso-Viña del Mar, January 1<sup>st</sup>  
 2 2010 – December 31<sup>st</sup> 2017

3

	Naïve model				Uber-oriented model				Full model			
	$\beta$	95%	CI	P-value	$\beta$	95%	CI	P-value	$\beta$	95%	CI	P-value
Time	-0.003	-0.007	0.001	0.129	0.003	-0.004	0.010	0.466	0.003	-0.004	0.010	0.466
Zero tolerance law	-0.370	-0.976	0.236	0.214	-0.384	-1.023	0.255	0.239	-0.384	-1.023	0.256	0.239
Zero tolerance law change in trend					-0.010	-0.019	-0.001	0.026	-0.010	-0.019	-	0.026
Emilia law	0.173	-0.398	0.744	0.537	0.414	-0.191	1.020	0.179	0.307	-0.411	1.024	0.401
Emilia law change in trend					0.006	-0.003	0.016	0.204	0.009	-0.005	0.023	0.198
Uber	0.488	-0.047	1.022	0.064	0.351	-0.444	1.145	0.369	0.326	-0.411	1.024	0.406
Uber change in trend									-0.004	-0.020	0.011	0.583
Constant	2.438	2.112	2.765	<0.001	2.111	1.642	2.582	<0.001	2.112	1.642	2.582	<0.001
AR1	0.047	-0.053	0.147	0.342	0.033	-0.064	0.131	0.502	0.033	-0.068	0.133	0.511
AIC		1373.146				1371.940				1373.634		
Ljung-Box test		25.53				27.30				27.51		
K=24, Prob > chi2(23)		0.323				0.244				0.235		
Ljung-Box test		47.03				48.98				49.23		
K=48, Prob > chi2(47)		0.471				0.393				0.384		

4 AR: Autoregressive; AIC: Akaike information cri