

## Appendix L – Discussion on the Influential Points

### 1. Regression of Ln Urban Light Luminosity Sum with Similar Cities

The dataset has five science-related closed cities in total, including Protvino, Koltsovo, Raduzhny, Snezhinsk, and Sarov. In case one of these in particular is driving results, we run alternate regressions excluding each city, one-by-one. Table L.1 shows no influential point when regression on Ln Urban Light Luminosity Sum with similar cities because no matter without which one sic-related closed city, the coefficient does not change to be significantly different from zero.

TABLE L.1: RESULTS OF REGRESSION OF LN URBAN LIGHT SUM WITHOUT ONE SCIENCE-RELATED

	CITY, ADJACENT CITIES				
	(1)	(2)	(3)	(4)	(5)
	Without Protvino	Without Koltsovo	Without Raduzhny	Without Snezhinsk	Without Sarov
closed_city	0.365*** (0.0452)	0.348*** (0.0451)	0.337*** (0.0455)	0.343*** (0.0453)	0.346*** (0.0446)
urban_settle ment	-0.143 (0.0856)	-0.0827 (0.0781)	-0.0425 (0.0789)	-0.0659 (0.0785)	-0.0743 (0.0774)
Trip_Advisor	-0.381*** (0.0957)	-0.398*** (0.0978)	-0.409*** (0.0986)	-0.403*** (0.0982)	-0.400*** (0.0967)
sci_related	-0.114 (0.0863)	0.0385 (0.0839)	-0.100 (0.0861)	-0.0195 (0.0851)	0.00962 (0.0839)

_cons	9.632*** (0.0972)	9.397*** (0.0993)	9.443*** (0.100)	9.449*** (0.0997)	9.477*** (0.0982)
<i>N</i>	2228	2284	2228	2256	2256
<i>R</i> <sup>2</sup>	0.843	0.839	0.850	0.850	0.856

Similarly, there are only four closed cities without any information on the Trip Advisor is: Mezhgorye, Alexandrovsk, Lesnoy, and Mirny. Again, we run alternate regressions excluding each city, one-by-one. Based on the results, the significantly negative coefficient of the TripAdvisor indicator is driven by Mirny and Mezhgorye. Without either Mirny or Mezhgorye, the coefficient is statistically the same as zero.

TABLE L.2: RESULTS OF REGRESSION OF LN URBAN LIGHT SUM

WITHOUT ONE CITY WHOSE TRIP ADVISOR INDICATOR IS ONE (NOT LISTED), ADJACENT CITIES

	(1)	(2)	(3)	(4)
	Without Mezhgorye	Without Alexandrovsk	Without Lesnoy	Without Mirny
closed_city	0.342*** (0.0429)	0.342*** (0.0440)	0.342*** (0.0447)	0.342*** (0.0449)
urban_settlem ent	-0.0624 (0.0739)	-0.0624 (0.0759)	-0.0623 (0.0770)	-0.0624 (0.0774)

Trip_Advisor	-0.125 (0.107)	-0.684*** (0.102)	-0.548*** (0.107)	-0.172 (0.115)
sci_related	-0.0317 (0.0744)	-0.0317 (0.0763)	-0.0317 (0.0774)	-0.0317 (0.0779)
_cons	9.231*** (0.109)	9.759*** (0.103)	9.628*** (0.109)	9.253*** (0.116)
<i>N</i>	2284	2330	2312	2256
<i>R</i> <sup>2</sup>	0.864	0.855	0.852	0.853

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

## 2. Regression of Ln Urban Light Luminosity COUNT with Similar Cities

Tables L.3 and L.4 repeat L.1 and L.2 for urban luminosity COUNTS. Evidently, the science-related indicator's negative coefficient is Koltsovo. Without Koltsovo, the coefficient becomes zero with more than 90 percent confidence level. The absence of Sarov also makes the coefficient insignificantly different from zero. In short, the small numbers of science cities and those that do not appear at all on Trip Advisor make the results highly sensitive to particular observations, and also to whether the match is with adjacent or initially similar cities.

TABLE L.3: THE RESULTS OF REGRESSION OF LN URBAN LIGHT COUNT WITHOUT ONE SCIENCE-RELATED CITY, SIMILAR CITIES

	(1)	(2)	(3)	(4)	(5)
	Without Protvino	Without Koltsovo	Without Raduzhny	Without Snezhinsk	Without Sarov
closed_city	0.290*** (0.0394)	0.290*** (0.0397)	0.290*** (0.0396)	0.290*** (0.0397)	0.290*** (0.0394)
Trip_Advis or	-0.357*** (0.0835)	-0.357*** (0.0840)	-0.357*** (0.0837)	-0.357*** (0.0841)	-0.357*** (0.0835)
sci_related	-0.191* (0.0753)	-0.101 (0.0833)	-0.347*** (0.0851)	-0.191* (0.0847)	-0.133 (0.0846)
_cons	7.602*** (0.0852)	7.578*** (0.0858)	7.600*** (0.0855)	7.593*** (0.0859)	7.602*** (0.0852)
<i>N</i>	1729	1701	1701	1701	1729
<i>R</i> <sup>2</sup>	0.668	0.661	0.669	0.666	0.668

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

TABLE L.4: RESULTS OF REGRESSION OF LN URBAN LIGHT COUNT

WITHOUT ONE CITY WHOSE TRIP ADVISOR INDICATOR IS ONE (NOT LISTED), SIMILAR CITIES

	(1)	(2)	(3)	(4)
	Without	Without	Without Lesnoy	Without Mirny

	Mezhgorye	Alexandrovsk		
closed_city	0.290*** (0.0395)	0.290*** (0.0387)	0.290*** (0.0396)	0.290*** (0.0394)
Trip_Advisor	-0.137 (0.0962)	-0.632*** (0.0873)	-0.482*** (0.0927)	-0.0944 (0.0983)
sci_related	-0.191* (0.0754)	-0.191** (0.0739)	-0.191* (0.0757)	-0.191* (0.0753)
_cons	7.394*** (0.0976)	7.875*** (0.0891)	7.729*** (0.0945)	7.348*** (0.0995)
<i>N</i>	1701	1710	1701	1701
<i>R</i> <sup>2</sup>	0.671	0.683	0.670	0.670

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$