CASE 2. EXPLORING THE CAUSAL IMPACT OF VICTIM PRECAUTION ON CRIME

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Please note: due Friday, April 7, 2017, 18.00h CET. Late submissions will not be considered by the jury.

Background

The crime rate greatly depends on opportunities offered by potential victims. For instance, straightforward precautionary measures such as high-quality door locks and window and door frames have been shown to reduce the burglary risk significantly – without substantial displacement of burglary from well-protected homes to not-so-well-protected homes (Vollaard and Van Ours 2011).

Today's challenge is to exploit the geographical variation in the use of window and door shutters that you identified yesterday to explore the causal impact of this precautionary measure on victimization of burglary.

Data

Like yesterday, the data are based on two Dutch crime surveys, one conducted in 1993, 1994 and 1995 and another one in 2005, 2006, 2007 and 2008.

Given the short period covered, and the relative invariability of the use of shutters (see Figure 2 included in Case 1), the data should be seen as one snapshot of the situation in the mid-2000s and another one for the mid-1990s. Again, the lowest geographical identifier is the municipality (variable `municipality`, with `gemcode2008` as corresponding identifier).

Given the low prevalence of burglary, you may want to use the combination of burglary and attempted burglary as outcome variable (`burglary_inclattempt`), but you are also free to exclude attempts.

Questions

You should address the following two questions:

a) CAUSAL IMPACT

Exploit the geographical variation in the use of shutters to identify their causal impact on victimization of burglary. One strategy is to focus on those parts of the country that show the strongest geographic discontinuity in the use of this device.[1] If you follow this strategy, then show how the burglary rate varies with this source of variation in the use of the device. Explore discontinuities in other characteristics that may be related to the burglary risk, including income, social cohesion, and other burglary prevention measures such as burglar alarms – and how these observable characteristics affect the estimated effect of shutters on burglary risk. Also conduct falsification tests for other types of property crime such as theft from car.

You are free to use the findings from yesterday's case to derive a different identifying assumption. Obviously, you will be judged on the credibility of your source of exogenous variation in the use of shutters.

Note that due to data limitations, it may not be possible to provide an unbiased estimate of the causal effect. The challenge is to explore what is possible and what is not with the available data – and what that teaches us about the impact of this device. In other words, showing the limitations of your analysis, i.e. what you *cannot* do, is at least as valuable as showing what you *can* do.

b) HETEROGENEITY

Explore how the causal impact of shutters varies by the share of other residents within the same municipality who also have shutters.

Submit a printable file addressing the above two points plus accompanying figures/tables.

[1] A first exploration shows that this holds for the boundary of the large rivers Maas and Waal, in particular in the western part of the country. The variable `onder_rivieren` in the most recent dataset is 1 for the area south of the large rivers and 0 otherwise. The variable `onder_rivieren` is also 1 for the area between the large rivers Maas and Waal (this area is denoted by the variable `tussenmaasenwaal`). The variable `onder_rivieren` is also 1 for the peninsula of Goeree-Overflakkee (this area is denoted by the variable `goereeoverflakkee`). The discontinuity is strongest up to about the longitude of the city of Amersfoort. Towards the east, the geographic variation seems to be more gradual. If your team wants to focus on other sources geographic variation, then that is totally fine.

Some relevant literature:

On the causal effect of home security on burglary:

Vollaard, Ben & Jan van Ours, 2011, Does regulation of built-in security reduce crime? Evidence from a natural experiment, *Economic Journal*, 121 (552), 485-504.

On (geographic) regression discontinuity designs:

Lee, David S. & Thomas Lemieux, 2010, Regression discontinuity designs in economics, *Journal of Economic Literature*, 48 (2), 281-355.

Keele, Luke & Rocio Titiunik, 2014, Geographic boundaries as regression discontinuities, *Political Analysis*, 23, 127-155.

An application of the geographic regression discontinuity design:

Dell, Melissa, 2010, The persistent effects of Peru's mining mita, *Econometrica*, 78 (6), 1863-1903.