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Short Research Essay - Example 1 - Advanced Project

I partially identify the marginal treatment effect (MTE) function when the treatment variable is misclassified. To do so, I explore three sets of restrictions on the relationship between the instrument, the misclassified treatment and the correctly measured treatment, allowing for dependence between the instrument and the misclassification decision. If the signs of the derivatives of the correctly measured propensity score and the mismeasured one are the same, I identify the sign of the MTE function at every point in the instrument's support. If those derivatives are close to each other, I bound the MTE function. Finally, by imposing a functional restriction between those two propensity scores, I derive sharp bounds around the MTE function and any weighted average of the MTE function.

Since many policy evaluation problems are associated with misclassified treatment variables and heterogeneous effects, my method has potentially many empirical applications. For example, when analyzing the effect of incarceration or alternative sentences in Crime Economics, the treatment variable will be misclassified if the researcher has information only about the trial judge ruling. In this context, measurement error is created by the appealing process because Appeals Court judges may reverse the trial judge's ruling (Green and Winik, 2010). Furthermore, education attainment (Black et al., 2003; Card, 2001; Kane et al., 1999), immigration status (Bernstein et al., 2019), unionization (Card, 1992; Bollinger, 1996) and welfare program participation (Hernandez et al., 2007; Hernandez and Pudney, 2007; Meyer et al., 2015, 2018; Meyer and Mittag, 2019a,b; Bruckmeier et al., 2021; Celhay et al., 2022) are likely to be mismeasured. Moreover, with the increasing availability of large data sets, prediction methods are being used to infer the treatment status in a variety of empirical questions (Black et al., 2020; Arellano-Bover, 2020). Since no prediction algorithm perfectly classifies the treatment status, the observed treatment variable is misclassified.

To exemplify the identification tools proposed in this work, I evaluate the effect of alternative sentences on recidivism in the State of São Paulo, Brazil, between 2010 and 2019. To do so, I observe full trial judge's sentences and divide them into two groups: (i) punished, containing defendants who were fined or sentenced to community services, and (ii) not punished, containing defendants who were acquitted or whose cases were dismissed. To measure recidivism, I check whether the defendant's name appears in any criminal case within two years after the final sentence date.

This context illustrates my framework because the treatment variable is misclassified due to specific institutional features. In Brazil, defendants will only fulfill their sentences after their judicial case is closed, implying that they will only be punished after the Appeals process or after they inform the Court System that they will not appeal. Consequently, using only trial judge's rulings to define which defendants were punished with an alternative sentence introduces a natural misclassification problem.

When I estimate the MTE function while accounting for a misclassified treatment variable, I find that the effect of alternative sentences on recidivism is likely small.

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