

Questions for David Muhlhausen from Senator Arlen Specter

1. In your testimony, you mention that the original results of Professor Ray Paternoster's study, commissioned by then-Governor of Maryland Glendening, which found that black defendants who murder white victims were more likely to be sentenced to death, was statistically unsound.
 - a. Why did Professor Richard Berk determine that Professor Paternoster's study could not stand up to statistical scrutiny?

Professor Richard Berk found that the results of Professor Paternoster's study do not stand up to statistical scrutiny.¹ The logit model used by Professor Paternoster to predict capital charges has accuracy problems. For example, Professor Berk found that the model misclassified cases with a capital charge for 40 percent of the time, while 12 percent of cases were incorrectly predicted to receive no capital charge. Professor Paternoster's model inadequately differentiates between cases in which a capital charge is likely and cases in which the charge is unlikely. This statistical imprecision make drawing valid conclusions based on Professor Paternoster's modeling very difficult to obtain.

- b. Aside from determining that the results of Professor Paternoster's study were inaccurate, what else did Professor Berk's study determine?

Professor Berk makes a methodological point that using causal modeling to understand the role of the defendant's race and victim's race can lead to fragile results. Using three different statistical techniques—logistic regression, classification and regression trees (CART), and random forests analysis—Professor Berk found varying results. First, the logistic modeling used by Professor Paternoster failed to adequately predict capital cases. Second, the CART analysis found no racial effects. Third, the random forests analysis found that cases with a black defendant and white or other race victim were less likely to receive a capital sentence.

2. In your testimony you mention that cases with a black defendant and white victim or "other" racial combination are *less* likely to have a death sentence. Can you elaborate on this?

According to Professor Berk's re-analysis, "for both capital charges and death sentences, race either played no role or a small role that is very difficult to specify based on the three statistical models used in his study. In short, it is very difficult to find convincing evidence for racial effects in the Maryland data and if there are any, they may not be additive."² Further, Professor Berk's random forests analysis indicates that race may have a small influence because "cases with a black defendant and white victim or 'other' racial combination are *less* likely to have a death sentence."³ Regardless of the findings by Professors Berk and Paternoster, decision-makers involved in potential capital cases should make their

decisions based on the severity of the crime and not worry about the race of the offender and victim.

3. In your testimony you point to a number of studies using panel data sets that indicate that the death penalty is an effective crime deterrent. Can you tell us more about panel data studies and the accuracy of their results?

Panel studies observe multiple units over several time periods. The addition of multiple data collection points gives the results of panel studies substantially more credibility than cross-sectional studies.

Policymakers should read capital punishment studies based on cross-sectional data (e.g., cross-state comparisons within a single year) with an air of caution. First, cross-sectional data does not allow researchers to control for important differences between states that explain varying murder rates. For example, states with high murder rates may be more likely to implement the death penalty, while states low murder rates may be less likely to use the death penalty. Thus, any cross-sectional comparison of these states will likely indicate that the death penalty states have higher murder rates than the non-death penalty states. It would be erroneous to conclude that the death penalty increases murder rates. In fact, cross-sectional studies have little use in evaluating the effectiveness of many criminal justice policies.⁴

To tease out the effect of the death penalty, social scientists need to use panel data. Panel data allows researchers to examine the effect of the death penalty over time within and between states. Panel data allows researchers to measure changes in murder rates after the implementation of the death penalty. Cross-sectional studies cannot measure these changes. The overwhelming majority of panel studies published in recent years strongly suggest that capital punishment deters murders.

Third, by increasing the number of data points compared to cross-sectional statistics, panel analysis increases the degrees of freedom and reduces possible collinearity among the independent variables, thus improving the efficiency of the econometric estimates. Fourth, panel analysis also reduces omitted variable bias by introducing cross-sectional and time-specific fixed effects into the model specification.⁵

¹ Richard Berk, Azusa Li, and Laura J. Hickman, "Statistical Difficulties in Determining the Role of Race in Capital Cases: A Re-analysis of Data from the State of Maryland," *Journal of Quantitative Criminology*, Vol. 21, No. 4 (December, 2005), pp. 365–390.

² *Ibid.*, p. 386.

³ *Ibid.*, p. 381.

⁴ For example, University of Pennsylvania Professor Lawrence Sherman's 1992 review of policing strategies intended to reduce crime excluded cross-sectional studies of large cities because cross-sectional

data are not well suited for explaining changes in crime rates . See Lawrence Sherman, “Police and Crime Control,” in Michael Tonry and Norval Morris, eds., *Modern Policing* (Chicago: University of Chicago Press, 1992), pp. 159–230.

⁵Cheng Hsiao, *Analysis of Panel Data* (Cambridge, U.K.: Cambridge University Press, 1986).