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Ashley B. Pitcher* (ashley.pitcher@balliol.oxon.org), CAMS-EHESS, 54 bd Raspail,
75270 Paris Cedex 06, France. *Optimal control of a model of offending and
re-offending*. Preliminary report.

Whether or not to commit a crime is assumed to be based on the probability of punishment. If offenders are caught, they are subjected to a certain, immediate punishment. It is more costly to raise the probability of punishment for first-time offenders, because that would likely require an overall elevation in general policing. However, offenders known to police are easier/cheaper to apprehend because they can be watched more closely or because their DNA and fingerprints are in the system. A simple model is proposed for the cycle of offending and re-offending. Optimal control theory is used to minimize an objective functional representing the costs associated with raising the probability of punishment and the costs associated with the level of crime. The control variables are the probabilities of punishment for first-time offenders, known criminals and unknown criminals. The optimal strategy of course depends on the function used for how criminals react to a rise the probability of punishment. Different possibilities for this function are explored. (Received August 16, 2010)