Technological Advance in Cholesterol Medication Meets Physician Learning: A Non-Parametric Bounding Approach

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Abstract

In this paper we investigate the relation between technological advance, in the form of an information shock, and changes in physicians and patient behavior. We focus on the case of statins, a medication used to manage high cholesterol levels, where newly produced evidence has altered the scientific consensus regarding side effect profiles. Early common wisdom held that statins may cause liver damage and therefore patients should be regularly tested for changes in liver enzyme levels. In 2010 GREACE, a large and influential randomized controlled trial, suggested instead that the medication could be continued despite elevated liver enzymes, and that patients need not be tested regularly for liver damage. We exploit this major informational technological shock to test how physicians prescription and testing behavior and patients adherence to therapy changed in response. We test our model using a unique dataset representative of the Italian population, that links patients to doctors over the period 2003-2014. We account for the possible non-random sorting of patients into treatment by exploiting an instrument which is assigned effectively at random. We employ a non-parametric bounding approach that takes into account the selection mechanism (unlike ordinary least squares) and permits conclusions about the entire population (unlike standard instrumental variables estimation). Our results show that doctors responded promptly to this technological shock.

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*Replication files and additional results will be available at the webpage: http://sites.google.com/site/domdepalo/. The views expressed in this paper are those of the authors and do not imply any responsibility of their institutions. Corresponding address: Domenico Depalo, Banca d'Italia, Economics and Statistics Department, Via Nazionale, 91 - 00184 Roma, Tel.: 39-06-4792 5989, e-mail: domenico.depalo@bancaditalia.it