

## Variational analysis and mathematical economics 2: Nonsmooth regular economies

A.D. Ioffe

Department of Mathematics, Technion, Haifa 32000, Israel  
(e-mail: alexander.ioffe38@gmail.com)

*. . . In order for the analysis to be useful  
it must provide information concerning  
the way in which our equilibrium quantities  
will change as a result of change of  
parameters taken as an independent data*

P. Samuelson,  
“Foundations of Economic Analysis” 1947

**Received:** April 19, 2010

**Revised:** July 26, 2010

**JEL classification:** D11, C62

**Mathematical Subject Classification (2010):** 14P10, 49J52, 91B02, 91B42

**Abstract.** We introduce and study a quantitative concept of regularity (in the spirit of variational analysis) for exchange economies with set-valued demand correspondences and prove that in case the latter are semi-algebraic, every economy with the exception of a set of smaller dimension are regular. We also discuss the determinacy problem for such economies.

**Key words:** excess demand correspondence, equilibrium price, regular economy, coderivative, critical value of a set-valued map, semi-algebraic mapping